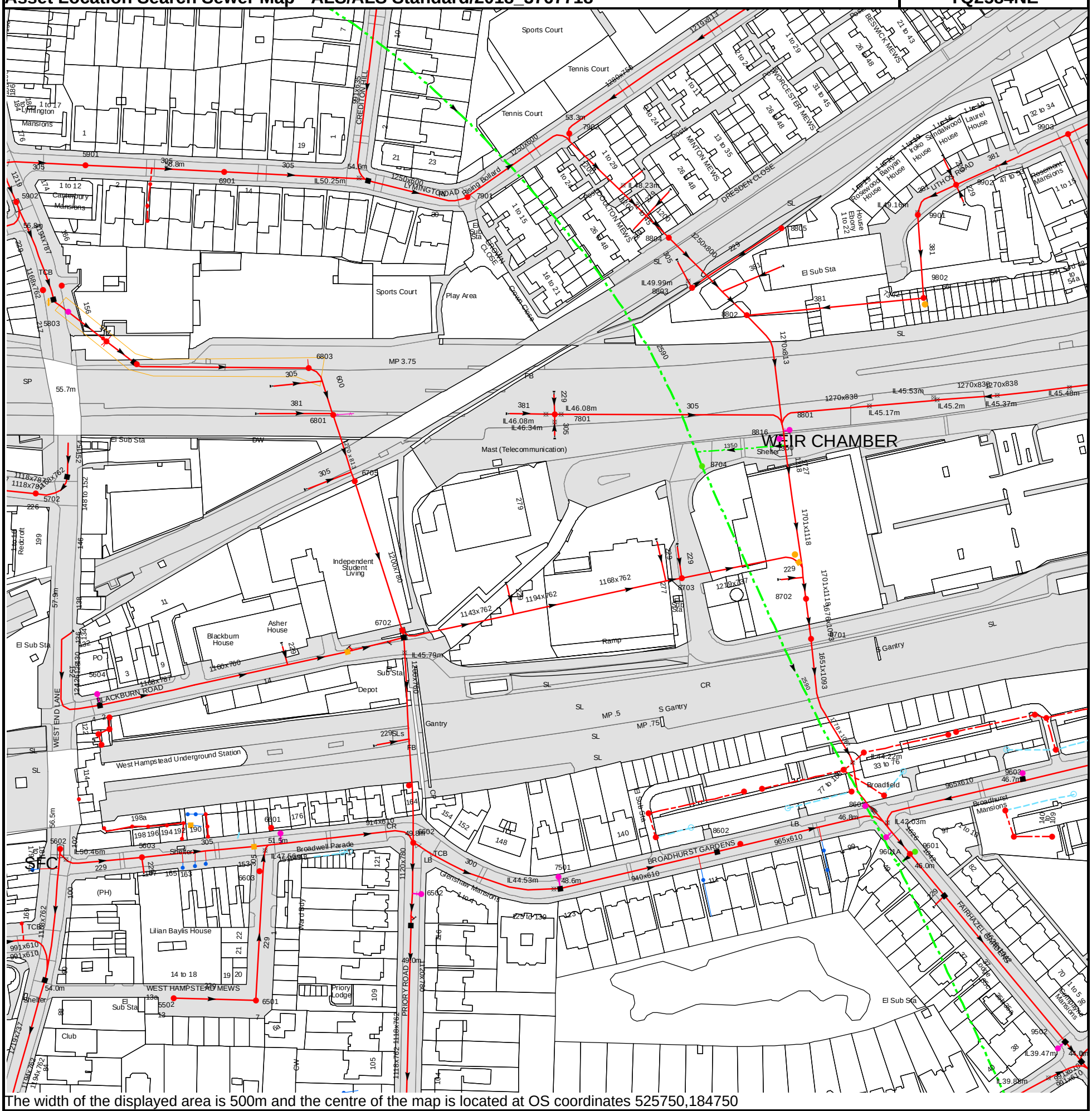
Asset Location Search Sewer Map - ALS/ALS Standard/2018_3767718

TQ2584NE



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 525750,184750

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NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
96BI	n/a	n/a
96CE	n/a	n/a
96CD	n/a	n/a
96CB	n/a	n/a
96CC	n/a	n/a
8701	49.78	44.64
8702	49.13	44.68
8816	49.1	44.2
8801	n/a	n/a
8802	53.15	46.06
76AB	n/a	n/a
76AC	n/a	n/a
86BD	n/a	n/a
8602	47.38	43.41
86BC	n/a	n/a
86BB	n/a	n/a
86BE	n/a	n/a
861B	n/a	n/a
86AJ	n/a	n/a
86BF	n/a	n/a
86AI	n/a	n/a
8603	46.58	44.58
96CF	n/a	n/a
961A	n/a	n/a
96CG	n/a	n/a
9601	46.6	29.86
96BD	n/a	n/a
96BG	n/a	n/a
9603	46.67	n/a
96BF	n/a	n/a
96CA	n/a	n/a
96BC	n/a	n/a
9502	44.25	39.42
851B	n/a	n/a
7501	n/a	n/a
861A	n/a	n/a
9601A	46.15	41.36
6501	50.84	49.56
6502	n/a	n/a
6603	n/a	n/a
561G	n/a	n/a
561F	n/a	n/a
561E	n/a	n/a
66BE	n/a	n/a
66BF	n/a	n/a
6602	49.87	45.06
56CD	n/a	n/a
6601	n/a	n/a
66DJ	n/a	n/a
56CC	n/a	n/a
56CI	n/a	n/a
56CB	n/a	n/a
561A	n/a	n/a
561B	n/a	n/a
66CI	n/a	n/a
56BG	n/a	n/a
581C	50.23	47.53
5907	n/a	n/a
5906	n/a	n/a
5908	n/a	n/a
6901	56.15	50.97
6803	48.34	46.65
6801	48.05	46.42
6705	n/a	46.25
6702	50.83	46.18
7901	53.34	49.07
7801	48.05	n/a
8804	n/a	n/a
8703	48.77	45.2
8803	52.01	49.2
8704	48.56	30.78
56BE	n/a	n/a
56BF	n/a	n/a
56BH	n/a	n/a
5604	n/a	n/a
5702	56.02	51.43
581A	55.17	47.62
5803	55.64	51.24
581D	50.23	47.53
581F	50.23	47.53
581E	50.23	47.53
5902	56.84	52.16
5901	57.21	51.77
551A	n/a	n/a
561C	n/a	n/a
5602	55.89	49.55
561D	n/a	n/a
56DC	n/a	n/a
56DB	n/a	n/a
5603	53.54	49.43

Manhole Reference	Manhole Cover Level	Manhole Invert Level
56DA	n/a	n/a
56CJ	n/a	n/a
5502	52.33	50.48
56DD	n/a	n/a
9802	53.42	48.16
8805	52.9	50.57
9901	53.22	49.09
9902	54.18	49.87
9903	55.25	51.37
7902	53.14	48.56

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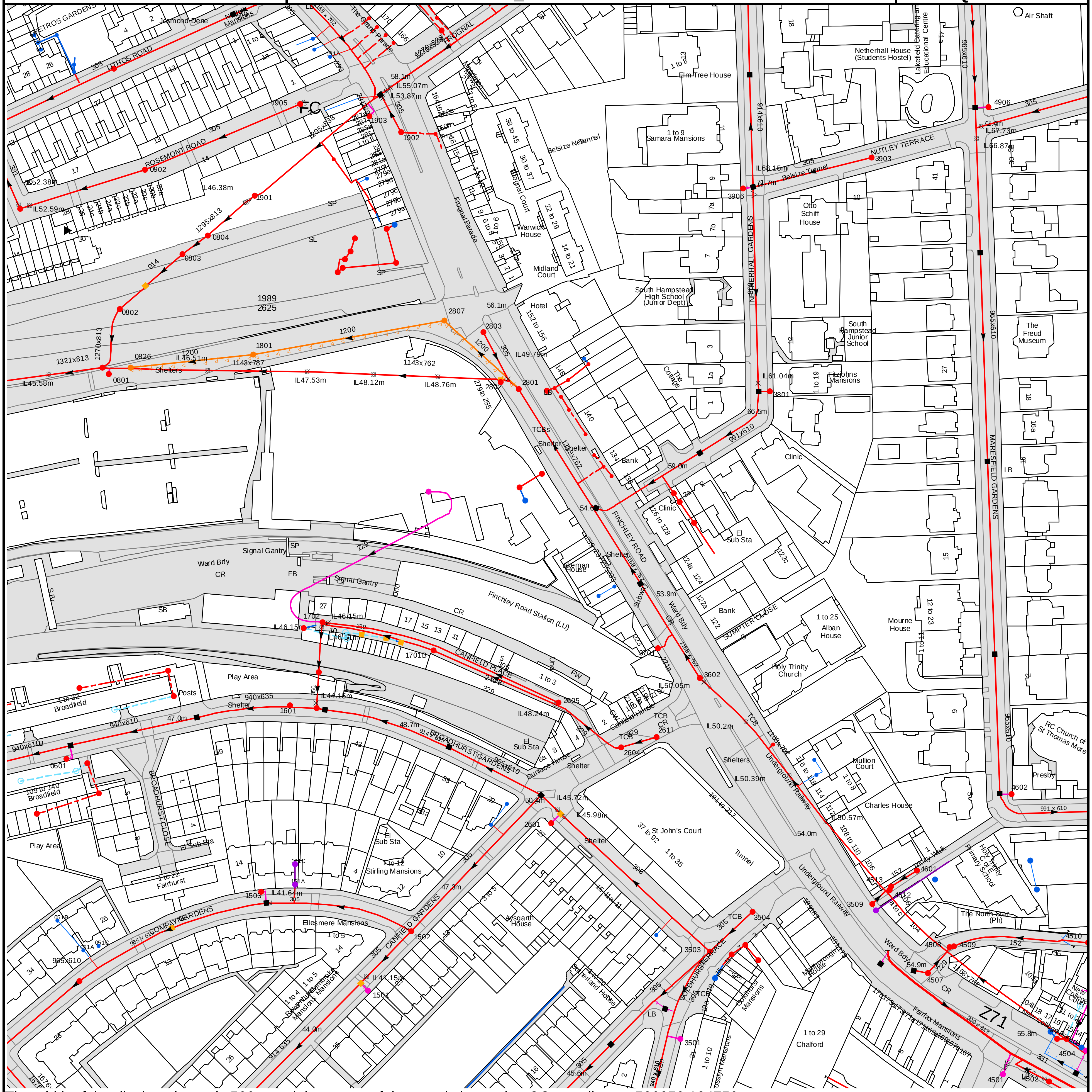
Asset Location Search Sewer Map - ALS/ALS Standard/2018_3767718 | **TQ2684NW**



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 526250,184750

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Manhole Reference	Manhole Cover Level	Manhole Invert Level
4906	n/a	n/a
4501	54.71	n/a
4602	n/a	n/a
46AI	n/a	n/a
45DG	n/a	n/a
4502	55.61	49.91
45DC	n/a	n/a
45DA	n/a	n/a
45CJ	n/a	n/a
45CI	n/a	n/a
45DB	n/a	n/a
4504	56.29	51.57
4510	61.48	n/a
35BJ	n/a	n/a
4507	54.72	53.27
35CD	n/a	n/a
35CB	n/a	n/a
4508	56.38	53.21
4509	56.52	55.45
35CC	n/a	n/a
3504	52.33	48.88
451A	n/a	n/a
3509	54.32	52.46
4512	55.99	50.83
4513	55.96	52.38
45EF	n/a	n/a
261B	n/a	n/a
261A	n/a	n/a
2601	n/a	n/a
2605	52.05	50.07
271B	n/a	n/a
271C	n/a	n/a
2604	52.67	48.54
2611	53.12	49.01
3701	n/a	n/a
3705	n/a	n/a
3706	n/a	n/a
3602	53.34	52.43
361A	n/a	n/a
361B	n/a	n/a
361C	n/a	n/a
4601	58.43	57.79
2803	55.99	52.04
2802	n/a	n/a
2801	55.4	49.44
27CJ	n/a	n/a
27CI	n/a	n/a
27DA	n/a	n/a
28CI	n/a	n/a
28CH	n/a	n/a
281C	n/a	n/a
28CG	n/a	n/a
281B	n/a	n/a
28CE	n/a	n/a
281A	n/a	n/a
28CF	n/a	n/a
271E	n/a	n/a
271D	n/a	n/a
271A	n/a	n/a
3704	n/a	n/a
3906	n/a	n/a
3801	n/a	n/a
3903	72.04	69.19
3501	n/a	n/a
1501	45.13	n/a
3503	50.97	47.23
351A	n/a	n/a
1502	46.46	42.31
1503	n/a	n/a
151A	n/a	n/a
161C	n/a	n/a
161B	n/a	n/a
1601	47.44	43.74
06BH	n/a	n/a
161A	n/a	n/a
06BE	n/a	n/a
1701B	50.28	47.36
17BD	n/a	n/a
17BE	n/a	n/a
17BC	n/a	n/a
1702	48.6	n/a
1703	n/a	n/a
1801	49.02	46.5
2807	55.9	48.57
18AH	n/a	n/a
18AG	n/a	n/a
18AD	n/a	n/a
18AJ	n/a	n/a
0803	49.12	46.09
18AI	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
18BB	n/a	n/a
0804	51.78	46.19
18AE	n/a	n/a
18AF	n/a	n/a
1901	56	50.41
191C	n/a	n/a
191D	n/a	n/a
291A	n/a	n/a
1902	57.86	54.02
06BG	n/a	n/a
06BB	n/a	n/a
0801	50.19	n/a
0826	49.4	46.13
auto	n/a	n/a
0802	49.31	45.87
06AF	n/a	n/a
06AJ	n/a	n/a
0601	n/a	n/a
06AG	n/a	n/a
06AH	n/a	n/a
06BA	n/a	n/a
auto	n/a	n/a
051A	n/a	n/a
051C	n/a	n/a
051B	n/a	n/a
1905	58.3	55.92
191H	n/a	n/a
191B	n/a	n/a
191A	n/a	n/a
1903	n/a	n/a
191I	n/a	n/a
191G	n/a	n/a
191F	n/a	n/a
191E	n/a	n/a
1916	n/a	n/a
2901	n/a	n/a
091A	n/a	n/a
0902	57.55	53.8
091C	n/a	n/a
091B	n/a	n/a
091H	n/a	n/a
091F	n/a	n/a
091E	n/a	n/a
091D	n/a	n/a
091G	n/a	n/a

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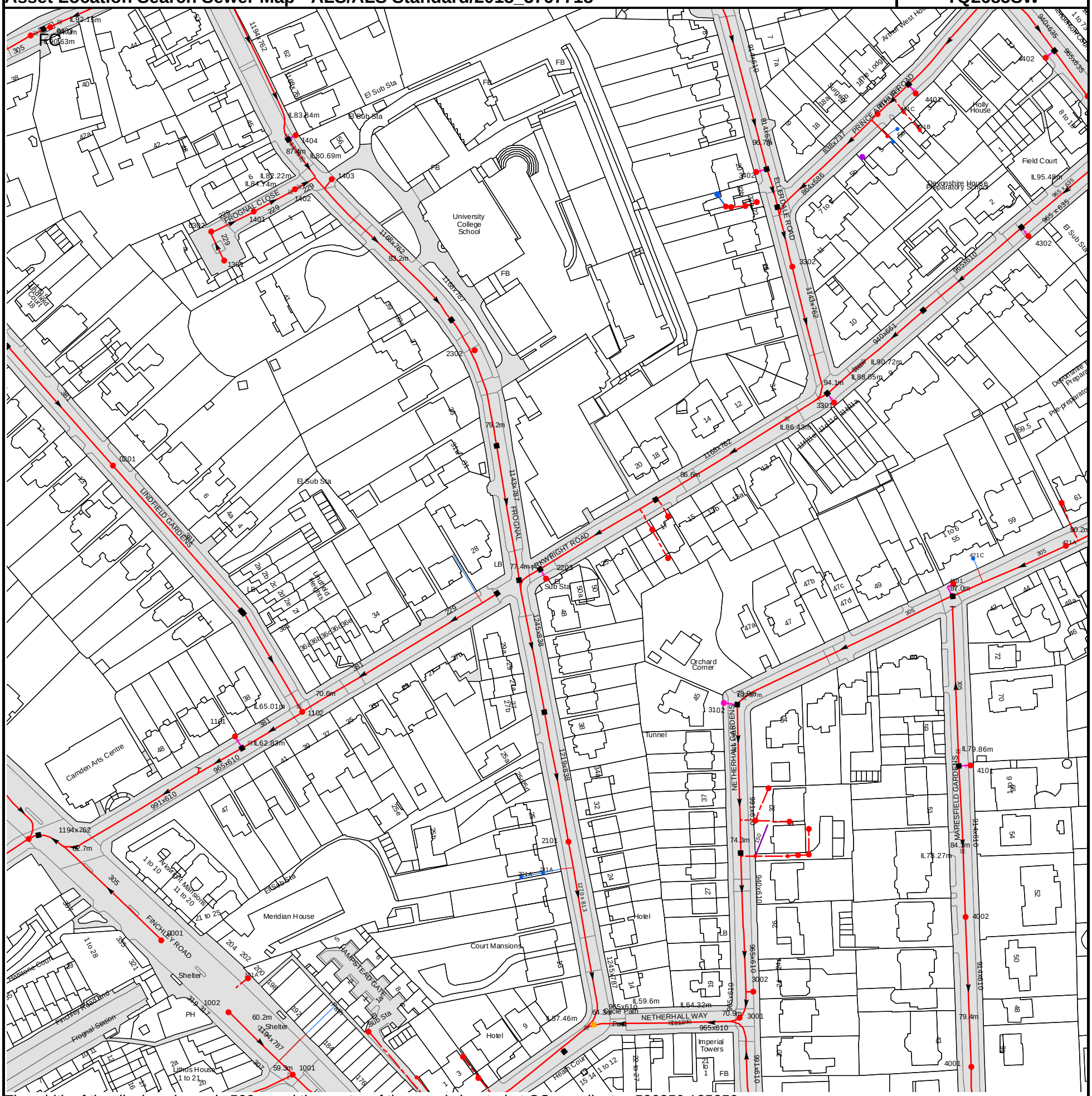
Asset Location Search Sewer Map - ALS/ALS Standard/2018_3767718

TQ2685SW



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 526250,185250

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Manhole Reference	Manhole Cover Level	Manhole Invert Level
34BH	n/a	n/a
34BI	n/a	n/a
34BJ	n/a	n/a
34CA	n/a	n/a
3402	n/a	n/a
34CB	n/a	n/a
341A	n/a	n/a
441G	n/a	n/a
441F	n/a	n/a
441D	n/a	n/a
441E	n/a	n/a
441C	n/a	n/a
4401	n/a	n/a
441B	n/a	n/a
4302	n/a	n/a
4402	n/a	n/a
441A	n/a	n/a
3112	n/a	n/a
3105	n/a	n/a
3111	n/a	n/a
3107	n/a	n/a
3302	n/a	n/a
3110	n/a	n/a
3108	n/a	n/a
3109	n/a	n/a
3301	n/a	n/a
4201	n/a	n/a
4002	82.58	76.52
4101	n/a	n/a
4001	76.82	71.76
421C	n/a	n/a
4206	n/a	n/a
421A	n/a	n/a
1001	59.4	54.85
1004	n/a	n/a
1005	n/a	n/a
2007	n/a	n/a
2008	n/a	n/a
3001	70.81	64.89
1002	60.41	55.76
3002	n/a	n/a
101A	n/a	n/a
201A	n/a	n/a
211A	n/a	n/a
2101	69.04	62.55
3106	n/a	n/a
1101	n/a	n/a
1102	70.36	64.86
3102	n/a	n/a
2203	n/a	n/a
3201	n/a	n/a
2210	n/a	n/a
3202	n/a	n/a
2302	n/a	n/a
1301	89.91	87.74
0302	89.8	87.09
1401	88.72	85.96
1402	86.98	n/a
1403	86.35	80.51
1404	88.07	n/a
0001	61.45	58.7
auto	n/a	n/a
auto	n/a	n/a
0403	93.85	n/a
0201	79.17	71.93

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ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

Foul: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.

Surface Water: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.

Combined: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.

Trunk Surface Water

Trunk Foul

Storm Relief

Trunk Combined

Vent Pipe

Bio-solids (Sludge)

Proposed Thames Surface Water Sewer

Proposed Thames Water Foul Sewer

Gallery

Foul Rising Main

Surface Water Rising Main

Combined Rising Main

Sludge Rising Main

Proposed Thames Water Rising Main

Vacuum

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

Air Valve

Dam Chase

Fitting

Meter

Vent Column

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

Control Valve

Drop Pipe

Ancillary

Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol, Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

Outfall

Undefined End

Inlet

Other Symbols

Symbols used on maps which do not fall under other general categories

Public/Private Pumping Station

Change of characteristic indicator (C.O.C.I.)

Invert Level

Summit

Areas

Lines denoting areas of underground surveys, etc.

Agreement

Operational Site

Chamber

Tunnel

Conduit Bridge

Other Sewer Types (Not Operated or Maintained by Thames Water)

Foul Sewer

Surface Water Sewer

Combined Sewer

Gulley

Culverted Watercourse

Proposed

Abandoned Sewer

Notes:

1) All levels associated with the plans are to Ordnance Datum Newlyn.
2) All measurements on the plans are metric.
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.
4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
5) 'na' or '0' on a manhole level indicates that data is unavailable.
6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in milimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property Insight on 0845 070 9148.

Appendix F Camden Flood SuDS Proforma

Pro-forma for any schemes in flood risk areas & all major development - Camden LLFA

All yellow boxes **must** be completed on this and all relevant tabs
Complete peach cells with source document and section/page references, required to support/justify responses
Do not edit grey cells
Please note guidelines / notes in column M
Complete all relevant tabs

Introduction: This Proforma is intended to help you understand the Sustainable Drainage and Flood Risk considerations that the Lead Local Flood Authority (LLFA) and Local Planning Authority (LPA) will take into account when considering an application in Camden, as well as helping us to consider the application. This does not replace the need also to provide where required a Drainage Statement, Flood Risk Assessment, and GLA-Camden SuDS Pro-forma, and observe the detailed guidance in ' Camden Planning Guidance (CPG) Water & Flooding'. Any information provided should be referenced to the relevant section of submitted supporting documents. This summary page will help provide key details on the application. Note that certain cells on this and other tabs will be populated automatically from previous answers given.

A. Application details

Planning reference (if known)				
Scheme name	O2 Fincheley Road, London			
Scheme address	255 Finchley Road, London,			
Postcode	NW36LU			
Scale of development as registered	Major			
Scale - policy subcategory	Major - largescale	Residential parts		Non-residential parts
Type(s) of development	Residential	New/re-build		
Site area, hectares	5.72	*100%*		
Of which total permeable area, to nearest 0.0001 ha	0	0%		
Of which total impermeable area, to nearest 0.0001 ha	5.14	90%		

	Existing	Proposed				
	TOTAL pre-development	For demolition	New-build incl. infills, re-build, extensions	Retained (refurbished or change of use)	TOTAL post-development	Net UPLIFT post-development
Total floor area of development (GIA)	0	0	43570	0	43570	43570
of which residential	0	0	43570	0	43570	43570
of which non- residential		51400	0	0	0	0
Number of residential units						
List all use class(es)						

Drainage Statement document details	104878-PEF-ZZ-ZZ-RP-D-100017
Flood Risk Assessment document details	104878-PEF-ZZ-ZZ-EP-D-100009

B. Flood Risk and SuDS - Policy & Documents Filter

Recommendation (Council to complete)			
	Site area 1 hectare or greater?	*Yes*	
	Major application?	*Yes*	
	In Critical Drainage Area?	Yes	
	In or bordering (<50m) Local Flood Risk Zone(s)?	Border	
	Name of LFRZ(s):	Goldhurst	
	On Historically Flooded Street 1975 or 2002?	No	
	Name of HFS(s):		
	Area at risk of flooding (surface water)?	*CHECK SITE DETAILS*	
	Elevated groundwater susceptibility or <50m of GW incid	No	
	In area with recorded sewer flooding incident?	Yes	
	In street with historical underground watercourse?	No	
	Area at risk of flooding (other relevant types)?	*Yes*	
	Basement proposed - new, enlarged or change of use?	No	
	IF YES, list proposed basement uses (all spaces):		
Approve/Condition/Refuse	*IF YES, are habitable or vulnerable use(s) included?*		
Approve/Condition/Refuse	*IF NO, is other (non-basement) vulnerable development p*	Yes	
	Vulnerable development in flood-prone area?	*Yes*	
	Site-specific Flood Risk Assessment (FRA) required?	*CHECK SITE DETAILS*	
Approve/Condition/Refuse	Site-specific FRA submitted?	Yes	**If Yes, go to Flood Risk Proposals tab**
	Drainage Statement (DS) required?	*CHECK SITE DETAILS*	
Approve/Condition/Refuse	DS submitted?	Yes	**If Yes, go to Flood Risk Proposals tab**
	Sustainable drainage (SuDS) proposals required?	*CHECK SITE DETAILS*	
Approve/Condition/Refuse	SuDS proposals submitted?	Yes	**If Yes, go to SuDS Proposals tab**
	FRA/DS/SuDS supporting evidence required?	*CHECK SITE DETAILS*	
Approve/Condition/Refuse	Supporting evidence submitted?	Yes	**If Yes, go to Flood Risk Proposals &/or SuDS Proposals ta**

Flood Risk Assessment, Proposals & Evidence

Recommendation (Council to complete)	**Assessments**	Required?	Document submitted?	Document title	Page/ section reference
	Site-specific Flood Risk Assessment	*CHECK SITE DETAILS*	*Yes*	104878-PEF-ZZ-ZZ-RP-D-100009	
	Drainage Statement	*CHECK SITE DETAILS*	*Yes*		
	SuDS Proposals tab completed	*CHECK SITE DETAILS*	Yes	104878-PEF-ZZ-ZZ-RP-D-100017	
	SuDS Proposals	*CHECK SITE DETAILS*	*Yes*	104878-PEF-ZZ-ZZ-RP-D-100017	
	SuDS Proposals tab completed	*CHECK SITE DETAILS*	Yes	104878-PEF-ZZ-ZZ-RP-D-100017	

Recommendation (Council to complete)	**Policy compliance**	Required?	Requirement met?	Document title	Page/ section reference
	Assessments address local, regional & national policies	*CHECK SITE DETAILS*	Yes	104878-PEF-ZZ-ZZ-RP-D-100009	Section 3
	include suitable research & quantification of site flood risks	*CHECK SITE DETAILS*	Yes	104878-PEF-ZZ-ZZ-RP-D-100009	Section 4
	address cumulative impact of developments	*CHECK SITE DETAILS*	Yes	104878-PEF-ZZ-ZZ-RP-D-100009	Section 2
	propose suitable flood ingress internal coping measures	*CHECK SITE DETAILS*	No		
	propose suitable flood risk mitigation measures	*CHECK SITE DETAILS*	Yes	104878-PEF-ZZ-ZZ-RP-D-100009	Section 5
	Internal water consumption target 105 l/p/d (residential)	*Yes*	N/A		
	External water consumption target 5 l/p/d (residential)	*Yes*	N/A		
	BREEAM Excellent water consumption target (non-resi >500m2)	*No*	Residential		
	Will not locate vulnerable development in flood-prone area	*Yes*	*No*	104878-PEF-ZZ-ZZ-RP-D-100009	Section 5
	Scheme does not increase flood risk on & off site	*CHECK SITE DETAILS*	Yes	104878-PEF-ZZ-ZZ-RP-D-100009	Section 6
	Scheme reduces on&off-site flood risk where possible	*CHECK SITE DETAILS*	Yes	104878-PEF-ZZ-ZZ-RP-D-100009	Section 5

Recommendation (Council to complete)	**Evidence supporting Assessments & Proposals**	Required?	Evidence submitted?	Document title	Page/ section reference
	Drawings showing site-specific flood risk up to 100yr+40%	*CHECK SITE DETAILS*	Yes	104878-PEF-ZZ-ZZ-RP-D-100009	Section 4
	Drawings showing proposed internal coping measures	*CHECK SITE DETAILS*	No		
	Drawings showing proposed flood mitigation measures	*CHECK SITE DETAILS*	Yes	104878-PEF-ZZ-ZZ-RP-D-100017	Appendix D
	Drawings showing proposed basement/ground floor uses	*CHECK SITE DETAILS*	Yes	Submitted Layout Plans	
	Building flood risk emergency evacuation plan		No		
	Drawings showing on&off-site overland exceedance flows	*CHECK SITE DETAILS*	No		
	Internal water calculations & proposals (resi)	*Yes*	No		
	External water calculations & proposals (resi)	*Yes*	No		
	BREEAM water calculations & proposals (non-resi >500m2)	*No*	Residential		

Guidelines / notes

Policy CC3 c. consider the impact of development in areas at risk of flooding

Policy CC3 c. consider the impact of development in areas at risk of flooding
(including drainage);

Policy CC3 b. avoid harm to the water environment and improve water quality& e. utilise Sustainable Drainage Systems (SuDS) in line with the drainagehierarchy to achieve a greenfield run-off rate where feasible

including Local Plan CC3, CPG, new London Plan, National Planning Policy Framework
including Strategic Flood Risk Assessment, Update LFRZ Map & EA Mapping
Policy CC3 c. consider the impact of development in areas at risk of flooding
Policy CC3 d. incorporate flood resilient measures in areas prone to flooding;
Policy CC3 d. incorporate flood resilient measures in areas prone to flooding;

Policy CC3 a. incorporate water efficiency measures
Policy CC3 a. incorporate water efficiency measures
Policy CC3 a. incorporate water efficiency measures

Policy CC3 f. not locate vulnerable development in flood-prone areas.
Policy CC3 The Council will seek to ensure that development does not increase flood risk
Policy CC3 The Council will seek to ensure that development...reduces the risk of flooding where possible

allowing 300mm freeboard to potential water ingress points

Policy CC3 a. incorporate water efficiency measures
Policy CC3 a. incorporate water efficiency measures
Policy CC3 a. incorporate water efficiency measures

Sustainable Drainage (SuDS) Assessment, Evidence and Proposals

Recommendation (Council to complete)	**Assessments**	Document submitted?	Document title	Page/ section reference
	Drainage Statement (DS)	*Yes*	104878-PEF-ZZ-ZZ-EP-D-100017	
	GLA-Camden SuDS Pro-forma (fully completed)	Yes	104878-PEF-ZZ-ZZ-EP-D-100017	Appendix E & F

Recommendation (Council to complete)	**Policy compliance**	Requirement met?	Document title	Page/ section reference
	DS must include identification of flood risk	Yes	104878-PEF-ZZ-ZZ-EP-D-100009	FRA document
	DS must include assessment of existing, greenfield & proposed runoff rates	Yes	104878-PEF-ZZ-ZZ-EP-D-100017	Section 3
	DS must include identification of measures, in line with the drainage hierarchy, to reduce runoff rates	Yes	104878-PEF-ZZ-ZZ-EP-D-100017	Section 3
	Achieve greenfield runoff rates wherever feasible, or as close as possible	Yes	104878-PEF-ZZ-ZZ-EP-D-100017	Sections 3, 4 & 5
	Constrain runoff volumes to greenfield for 100yr 6hr event where feasible	Yes	104878-PEF-ZZ-ZZ-EP-D-100017	Sections 3, 4 & 5
	Backstop target for unaltered buildings: >50% reduction in existing run-off	Yes	104878-PEF-ZZ-ZZ-EP-D-100017	Sections 3, 4 & 5
	Developments must include SuDS unless inappropriate	Yes	104878-PEF-ZZ-ZZ-EP-D-100017	Section 3.5
	Development should follow the detailed London Plan drainage hierarchy	Yes	104878-PEF-ZZ-ZZ-EP-D-100017	Section 3.1
	EA climate change factor applied: 2080s upper rainfall intensity allowance (40%)	Yes	104878-PEF-ZZ-ZZ-EP-D-100017	Appendix C

Recommendation (Council to complete)	**Evidence supporting Assessments & Proposals**	Evidence submitted?	Document title	Page/ section reference
	Drawings detailing SuDS extent & position (incl. outfalls, control points, levels)	Yes	104878-PEF-ZZ-ZZ-EP-D-100017	Appendix D
	Blue-green roof details with area & minimum 150mm substrate for storage	No		
	Results of cross-site infiltration rate or similar tests to show soil (in)compatibility	Yes	Geo-Environmental Report	
	Professional run-off calculations supporting rates & volumes reported in DS	Yes	104878-PEF-ZZ-ZZ-EP-D-100017	Appendix C and Section 2
	Drawings showing on&off-site overland exceedance flows	No	104878-PEF-ZZ-ZZ-EP-D-100009	No exceedance routes predicted
	Evidence of site surveys and investigations relating to drainage	Yes	104878-PEF-ZZ-ZZ-EP-D-100017	Appedix A, B and E
	Lifetime maintenance and adoption arrangements (and maintenance owner)	Yes	104878-PEF-ZZ-ZZ-EP-D-100017	Section 3.6
	Management of health & safety risks related to SuDS design	Yes	104878-PEF-ZZ-ZZ-EP-D-100017	Section 3.5
	Confirmation of discharge capacity (or correspondence) from relevant body eg TW	Yes	104878-PEF-ZZ-ZZ-EP-D-100017	Appendix E

Guidelines / notes

Policy CC3 c. consider the impact of development in areas at risk of flooding (including drainage);

Download from www.london.gov.uk/what-we-do/environment/climate-change/surface-

Policy CC3 e. utilise Sustainable Drainage Systems (SuDS) in line with the drainage hierarchy to achieve a greenfield run-off rate where feasible
& Policy CC3 supporting text §8.67

Policy CC3 e. utilise Sustainable Drainage Systems (SuDS) in line with the drainage hierarchy to achieve a greenfield run-off rate where feasible
& Policy CC3 supporting text §8.66

Policy CC3 e. utilise Sustainable Drainage Systems (SuDS) in line with the drainage hierarchy to achieve a greenfield run-off rate where feasible
& Policy CC3 supporting text §8.68

Appendix G Camden SuDS Proforma

Camden GREATERLONDONAUTHORITY LoDEG

1. Project & Site Details		
	Project / Site Name (including sub-catchment / stage / phase where appropriate)	O2 Finchley Road, London
	Address & post code	255 Finchely Road, London, NW56LU
	OS Grid ref. (Easting, Northing)	E 526164
		N 184818
	LPA reference (if applicable)	
	Brief description of proposed work	Urban regeneration development comprising approximately 1800 units and commercial and residential spaces surrounded by landscaped areas providing a link each end of the site and provide communal areas for residents.
	Total site Area	57,218 m^2
	Total existing impervious area	51,400 m^2
	Total proposed impervious area	43,570 m^2
	Is the site in a surface water flood risk catchment (ref. local Surface Water Management Plan)?	No
	Existing drainage connection type and location	Combined sewer drainage to the south of the site.
	Designer Name	Richard Holmes
	Designer Position	Associate
	Designer Company	Pell Frischmann

2. Proposed Discharge Arrangements			
	2a. Infiltration Feasibility		
	Superficial geology classification	No recorded superficial geology (BGS)	
	Bedrock geology classification	London Clay Formation	
	Site infiltration rate	m/s	
	Depth to groundwater level	1.26-1.89	m below ground level
	Is infiltration feasible?	No	
	2b. Drainage Hierarchy		
		Feasible (Y/N)	*Proposed (Y/N)*
	1 store rainwater for later use	Y	Y
	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	Y	Y
	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	Y
	2c. Proposed Discharge Details		
	Proposed discharge location	new surface and foul sewers across site	
	Has the owner/regulator of the discharge location been consulted?	Yes	

Camden GREATERLONDONAUTHORITY LoDEG

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)*
Qbar	24.9			
1 in 1	21.1	520	594	24.9
1 in 30	57.2	1240	2051	24.9
1 in 100	79.3	1337	3048	24.9
1 in 100 + CC			4605	24.9
Climate change allowance used		40%		
3b. Principal Method of Flow Control		Hydrobrake Manhole		

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	5650	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	500	0
Swales	0	250	0
Basins/ponds	0	0	0
Attenuation tanks	0		4319
Total	**0**	**6400**	**4319**

4. Supporting Information

4a. Discharge & Drainage Strategy	*Page/section of drainage report*
Infiltration feasibility (2a) – geotechnical factual and interpretive reports, including infiltration results	Factual Ground Investgation Report - RSK Geosciences - December 2021
Drainage hierarchy (2b)	Section 3.1
Proposed discharge details (2c) – utility plans, correspondence / approval from owner/regulator of discharge location	Section 3.2
Discharge rates & storage (3a) – detailed hydrologic and hydraulic calculations	Section 3.3
Proposed SuDS measures & specifications (3b)	Section 3.5
4b. Other Supporting Details	*Page/section of drainage report*
Detailed Development Layout	Appendix B/AHMM Architects
Detailed drainage design drawings, including exceedance flow routes	100006 Existing SW Catchment 100008 Proposed SuDS 100010 Proposed DS 100017 Overland Flow Routes
Detailed landscaping plans	EAST Landscape Architects
Maintenance strategy	Section 3.6
Demonstration of how the proposed SuDS measures improve:	
a) water quality of the runoff?	Section 3.5
b) biodiversity?	Section 3.5
c) amenity?	Section 3.5

Appendix H Greenfield Runoff Report

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Matthew Fox
Site name:	O2 Finchley Road
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:	51.54781° N
Longitude:	0.18388° W
Reference:	4259196723
Date:	Nov 03 2022 12:25

Runoff estimation approach IH124

Site characteristics

Total site area (ha): 5.72

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

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):	640	640
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 ≤ 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):	24.87	24.87
1 in 1 year (l/s):	21.14	21.14
1 in 30 years (l/s):	57.19	57.19
1 in 100 year (l/s):	79.32	79.32
1 in 200 years (l/s):	93	93

Appendix I Proposed Development Drainage Calculations

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	100	Maximum Time of Concentration (mins)	30
		Foul Sewage (l/s/ha)	0.000
FEH Rainfall Version	1999	Volumetric Runoff Coeff.	0.750
Site Location	GB 526100 184450 TQ 26100 84450	PIMP (%)	100
C (1km)	-0.025	Add Flow / Climate Change (%)	10
D1 (1km)	0.330	Minimum Backdrop Height (m)	1.500
D2 (1km)	0.277	Maximum Backdrop Height (m)	1.500
D3 (1km)	0.234	Min Design Depth for Optimisation (m)	1.200
E (1km)	0.332	Min Vel for Auto Design only (m/s)	1.00
F (1km)	2.519	Min Slope for Optimisation (1:X)	500
Maximum Rainfall (mm/hr)	50		

Designed with Level Soffits

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)
S1.002	S	49.150	46.060	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FEH	E (1km)	0.332
Return Period (years)	100	F (1km)	2.519
FEH Rainfall Version	1999	Summer Storms	Yes
Site Location	GB 526100 184450 TQ 26100 84450	Winter Storms	No
C (1km)	-0.025	Cv (Summer)	0.750
D1 (1km)	0.330	Cv (Winter)	0.840
D2 (1km)	0.277	Storm Duration (mins)	30
D3 (1km)	0.234		

Online Controls for Storm

Hydro-Brake® Optimum Manhole: S3, DS/PN: S1.002, Volume (m³): 8.4

Unit Reference	MD-SHE-0049-1500-2000-1500	Sump Available	Yes
Design Head (m)	2.000	Diameter (mm)	49
Design Flow (l/s)	1.5	Invert Level (m)	46.200
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	75
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.000	1.5	Kick-Flo®	0.438	0.8
Flush-Flo™	0.212	0.9	Mean Flow over Head Range	-	1.1

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)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.8	0.600	0.9	1.600	1.4	2.600	1.7	5.000	2.3	7.500	2.8
0.200	0.9	0.800	1.0	1.800	1.4	3.000	1.8	5.500	2.4	8.000	2.8
0.300	0.9	1.000	1.1	2.000	1.5	3.500	1.9	6.000	2.5	8.500	2.9
0.400	0.8	1.200	1.2	2.200	1.6	4.000	2.1	6.500	2.6	9.000	3.0
0.500	0.8	1.400	1.3	2.400	1.6	4.500	2.2	7.000	2.7	9.500	3.1

Storage Structures for Storm

Tank or Pond Manhole: S3, DS/PN: S1.002

Invert Level (m) 46.200

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	143.0	2.000	143.0	2.001	0.0