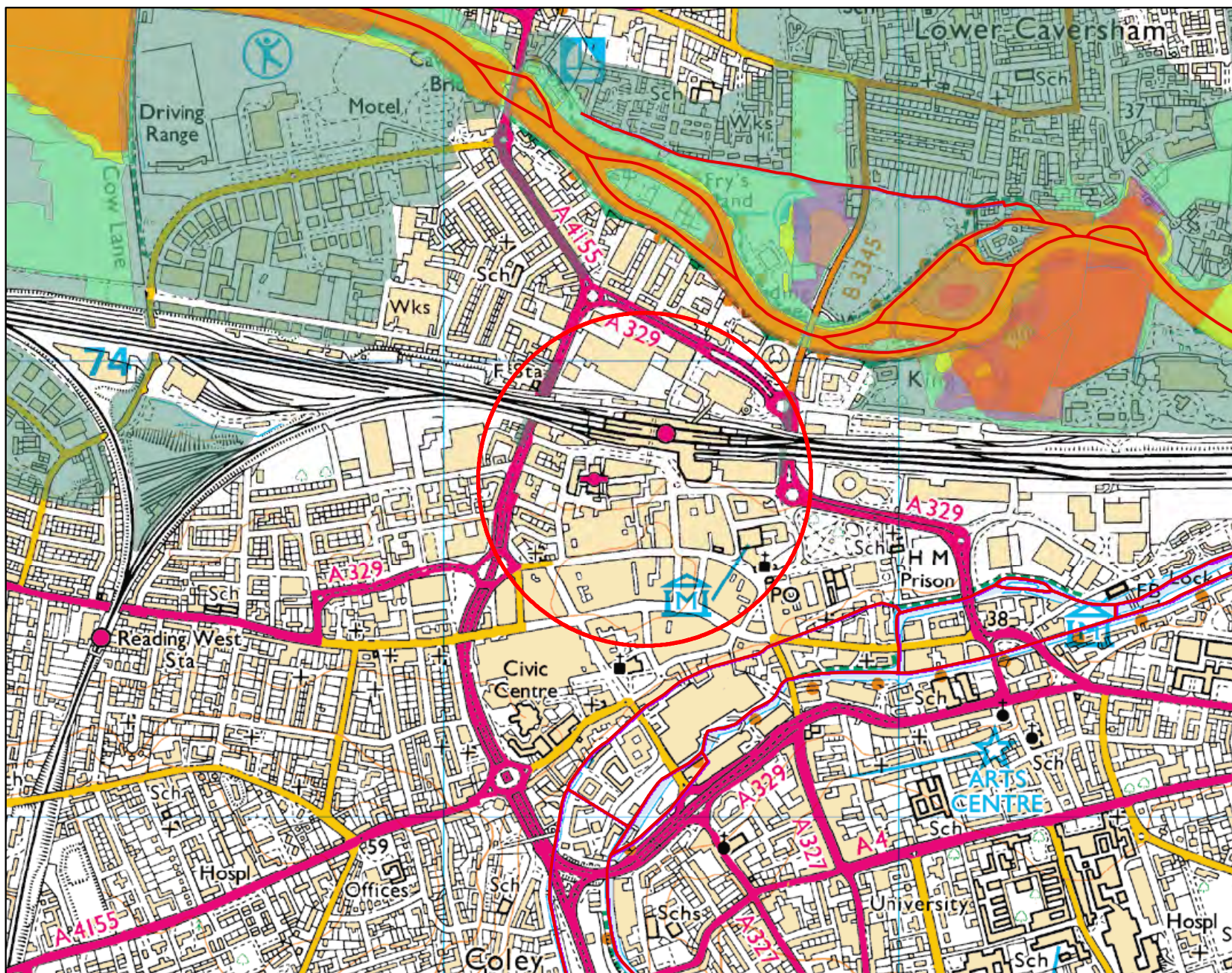


Historic Map centred on Station Hill, Reading, RG1 1NR

Created on 30/06/2014 REF: OX_0795_01



Kilometres

0 0.15 0.3

Legend

— Main River

Flood Event Outline

year

- 1947
- 1974
- 1977
- 2000
- 2002
- 2007

Flooding from rivers or sea without defences (Flood Zone 3) shows the area that could be affected by flooding:

- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

The Extent of an extreme flood (Flood Zone 2) shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

Historic flood data

OX_0795_01

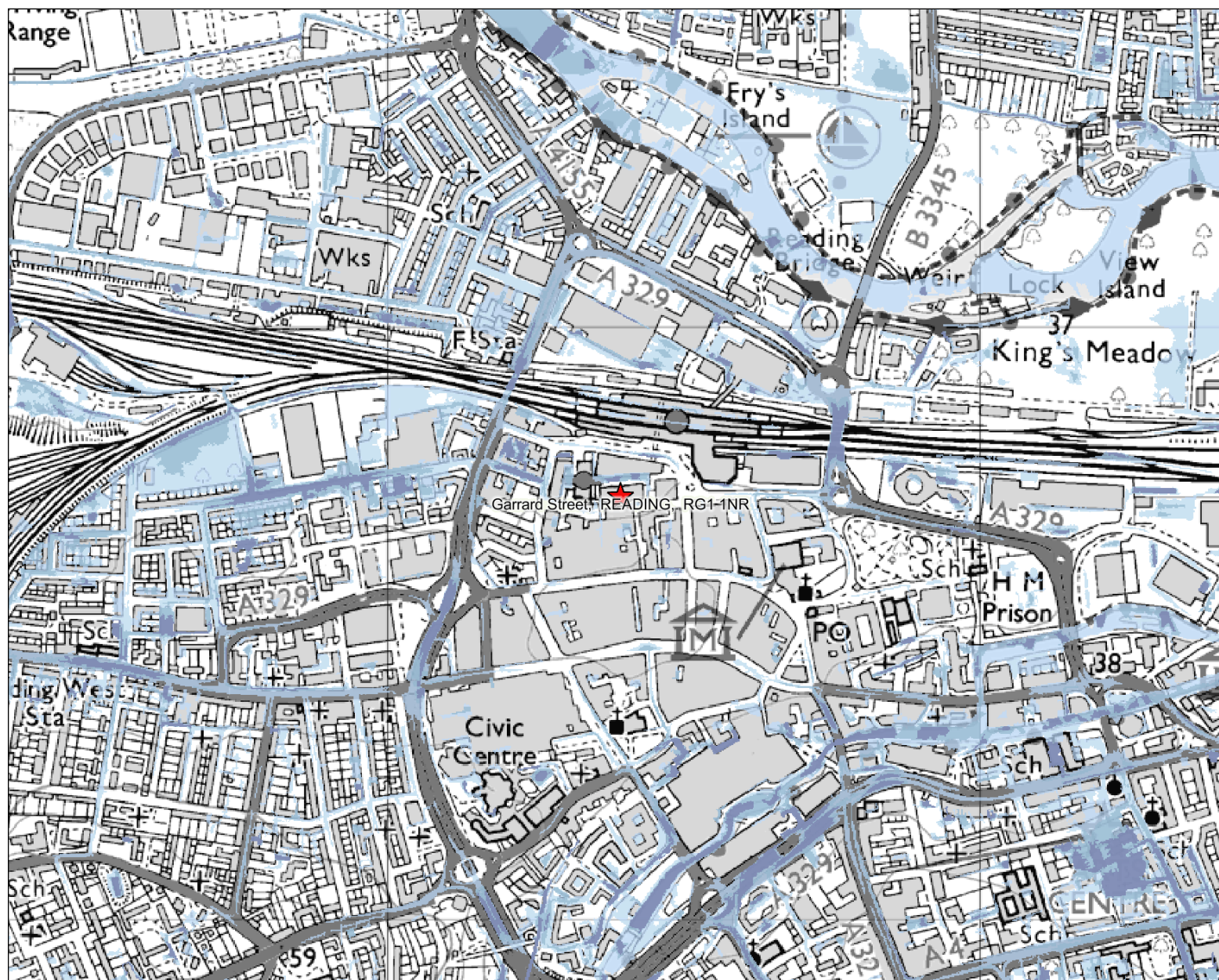
Our records show that the area of your site has been affected by flooding.
Information on the floods that have affected your site is provided in the table below:

Flood Event Code	Flood Event Name	Start Date	End Date	Source of Flooding	Cause of Flooding
EA0619470300429	06MarchSpring1947	01/01/1947	12/12/1947	main river	channel capacity exceeded (no raised defences)
EA0619741100359	06NovemberAutumn1974	01/01/1974	12/12/1974	main river	channel capacity exceeded (no raised defences)
EA0619770800424	06AugustSummer1977	01/01/1977	12/12/1977	main river	channel capacity exceeded (no raised defences)
EA0620001200992	06DecemberWinter2000	01/01/2000	12/12/2000	main river	channel capacity exceeded (no raised defences)
EA0620030101899	06JanuaryNewYear2003	23/12/2002	12/01/2003	main river	channel capacity exceeded (no raised defences)
ea061231434	Reading_Fluvial Water	19/07/2007	29/07/2007	main river	channel capacity exceeded (no raised defences)

Please note the Environment Agency maps flooding to land not individual properties. Floodplain extents are an indication of the geographical extent of a historic flood. They do not provide information regarding levels of individual properties, nor do they imply that a property has flooded internally.

Start and End Dates shown above may represent a wider range where the exact dates are not available.

Risk of flooding from Surface Water



Scale 1:10,001



Likelihood of flooding from Surface Water

- High
- Medium
- Low
- Very Low

Likelihood of flooding from Surface Water

- High: Greater than or equal to 1 in 30 (3.3%) chance in any given year
- Medium: Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance in any given year
- Low: Less than 1 in 100 (1%) but greater than or equal to 1 in 1,000 (0.1%) chance in any given year
- Very Low: Less than 1 in 1,000 (0.1%) chance in any given year

This information is shown on the Risk of Flooding from Surface Water map on our website.

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Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk



D. Thames Water Correspondence

Asset Location Search



Steve Brown
Waterman Transport & Development Ltd
Pickfords Wharf
Clink Street
LONDON
SE1 9DG

Search address supplied Site In
Reading
RG1 1NR

Your reference N/A
Our reference ALS/ALS Standard/2009_1444288

Search date 9 April 2009

**PLEASE NOTE THAT CHANGES TO THE STANDARD VAT RATE TO 15%
WILL BE SHOWN ON ALL INVOICES DATED ON OR AFTER MONDAY 1st
DECEMBER, 2008**

Credit card payments are available. Please phone 01189 251509

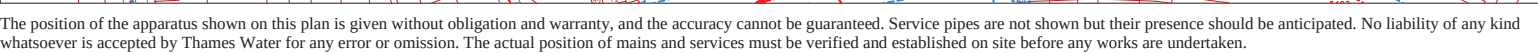
Thames Water Utilities Ltd

Property Insight
PO Box 3189
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F 0118 923 6655/57
E searches@thameswater.co.uk
I www.twpropertyinsight.co.uk

Registered in England and Wales
No. 2366661, Registered office
Clearwater Court, Vastern Road
Reading RG1 8DB



Comments:
Sewer plan



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.

-  Joint
-  Trunk Surface Water
-  Storm Relief
-  Vent Pipe
-  Proposed Thames Surface Water Sewer
-  Gallery
-  Surface Water Rising Main
-  Sludge Rising Main
-  Vacuum
-  Syphon

-  Trunk Foul
-  Trunk Combined
-  Bio-solids (Sludge)
-  Trade Effluent

-  Proposed Thames Surface Water Sewer
-  Foul Rising Main
-  Combined Rising Main
-  Proposed Thames Water Rising Main

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) For symbols referred to as 'Other' on this key, please see the plan for further information.
- 5) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.

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.

-  **AV** Air Valve
-  **LH** Lamp Hole
-  **BS** Blind Shaft
-  **LS** Lifting Shaft
-  **CP** Catch Pit
-  **ME** Meter
-  **DC** Dam Chase
-  **RE** Rodding Eye
-  **DF** Double Flushing Tank / Chamber
-  **VC** Vent Column
-  **SF** Single Flushing Tank / Chamber
-  **VT** Vent
-  **HB** Hatch Box
-  **WO** Washout
-  Other (specified on plan)

Operational Controls

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

-  **BD** Backdrop Manhole
-  **HY** Hydrobrake
-  **BV** Butterfly Valve
-  **PI** Petrol Interceptor
-  **CL** Clough
-  **PS** Penstock
-  **DB** Dam Board
-  **RV** Reflux Valve
-  **DP** Drop Pipe
-  **ST** Step
-  **DS** Drop Shaft
-  **SV** Sluice Valve
-  **FL** Flume
-  **TA** Tank
-  **FV** Flap Valve
-  **WW** Weir
-  **HW** Headwall
- Other (specified on plan)

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.

-  **STW** Effluent Discharge
-  **SA** Soakaway
-  **GU** Gully
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-

Printbox (471124,173453) -> (471632,173961)
Central Mapsheet : SU7173NW
User : RIMISSON
Time : Thu Apr 9 15:35:01 2009

The position of apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. 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 and established on site before any works are undertaken.

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

At (471134, 173613)	there is a MANHOLE with SHORT	NUMBER=1656	COVER=	0.00	INVERT=	-9999.00
At (471137, 173612)	there is a MANHOLE with SHORT	NUMBER=1657	COVER=	42.13	INVERT=	39.43
At (471125, 173639)	there is a MANHOLE with SHORT	NUMBER=1662	COVER=	-9999.00	INVERT=	-9999.00
At (471131, 173711)	there is a MANHOLE with SHORT	NUMBER=1702	COVER=	39.32	INVERT=	36.22
At (471127, 173714)	there is a MANHOLE with SHORT	NUMBER=1752	COVER=	39.25	INVERT=	37.63
At (471138, 173791)	there is a MANHOLE with SHORT	NUMBER=1761	COVER=	-9999.00	INVERT=	36.29
At (471195, 173877)	there is a MANHOLE with SHORT	NUMBER=1802	COVER=	38.03	INVERT=	35.55
At (471198, 173883)	there is a MANHOLE with SHORT	NUMBER=1803	COVER=	37.86	INVERT=	35.57
At (471192, 173875)	there is a MANHOLE with SHORT	NUMBER=1853	COVER=	38.07	INVERT=	35.99
At (471190, 173837)	there is a MANHOLE with SHORT	NUMBER=1856	COVER=	38.45	INVERT=	36.46
At (471221, 173559)	there is a MANHOLE with SHORT	NUMBER=2501	COVER=	44.74	INVERT=	41.58
At (471263, 173564)	there is a MANHOLE with SHORT	NUMBER=2503	COVER=	45.08	INVERT=	41.21
At (471219, 173557)	there is a MANHOLE with SHORT	NUMBER=2551	COVER=	44.67	INVERT=	42.97
At (471270, 173567)	there is a MANHOLE with SHORT	NUMBER=2554	COVER=	45.13	INVERT=	43.01
At (471292, 173503)	there is a MANHOLE with SHORT	NUMBER=2555	COVER=	-9999.00	INVERT=	-9999.00
At (471269, 173739)	there is a MANHOLE with SHORT	NUMBER=2701	COVER=	38.42	INVERT=	34.43
At (471267, 173735)	there is a MANHOLE with SHORT	NUMBER=2751	COVER=	38.40	INVERT=	36.89
At (471209, 173757)	there is a MANHOLE with SHORT	NUMBER=2754	COVER=	-9999.00	INVERT=	-9999.00
At (471283, 173804)	there is a MANHOLE with SHORT	NUMBER=2801	COVER=	39.02	INVERT=	36.60
At (471273, 173810)	there is a MANHOLE with SHORT	NUMBER=2802	COVER=	38.81	INVERT=	36.59
At (471281, 173805)	there is a MANHOLE with SHORT	NUMBER=2851	COVER=	39.01	INVERT=	36.39
At (471219, 173928)	there is a MANHOLE with SHORT	NUMBER=2902	COVER=	37.55	INVERT=	35.75
At (471217, 173962)	there is a MANHOLE with SHORT	NUMBER=2951	COVER=	38.06	INVERT=	36.67
At (471272, 173520)	there is a MANHOLE with SHORT	NUMBER=	COVER=	-9999.00	INVERT=	-9999.00
At (471274, 173541)	there is a MANHOLE with SHORT	NUMBER=	COVER=	-9999.00	INVERT=	-9999.00
At (471293, 173559)	there is a MANHOLE with SHORT	NUMBER=	COVER=	-9999.00	INVERT=	-9999.00
At (471296, 173542)	there is a MANHOLE with SHORT	NUMBER=	COVER=	-9999.00	INVERT=	-9999.00
At (471215, 173739)	there is a MANHOLE with SHORT	NUMBER=	COVER=	-9999.00	INVERT=	-9999.00
At (471278, 173522)	there is a MANHOLE with SHORT	NUMBER=	COVER=	-9999.00	INVERT=	-9999.00

Printbox (471124,173453)-> (471632,173961)
Central Mapsheet : SU7173NW
User : RIMISSON
Time : Thu Apr 9 15:35:01 2009

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At (471164, 173477)	there is a MANHOLE with SHORT NUMBER=1456	COVER=	44.43	INVERT=	42.66
At (471168, 173577)	there is a MANHOLE with SHORT NUMBER=1501	COVER=	43.40	INVERT=	40.34
At (471162, 173554)	there is a MANHOLE with SHORT NUMBER=1503	COVER=	44.38	INVERT=	41.04
At (471159, 173580)	there is a MANHOLE with SHORT NUMBER=1551	COVER=	43.35	INVERT=	41.10
At (471180, 173554)	there is a MANHOLE with SHORT NUMBER=1552	COVER=	44.50	INVERT=	41.85
At (471141, 173670)	there is a MANHOLE with SHORT NUMBER=1602	COVER=	39.48	INVERT=	37.13
At (471138, 173620)	there is a MANHOLE with SHORT NUMBER=1606	COVER=	0.00	INVERT=	-9999.00
At (471172, 173641)	there is a MANHOLE with SHORT NUMBER=1607	COVER=	43.34	INVERT=	40.40
At (471145, 173672)	there is a MANHOLE with SHORT NUMBER=1652	COVER=	39.44	INVERT=	38.24
At (471158, 173779)	there is a MANHOLE with SHORT NUMBER=1701	COVER=	0.00	INVERT=	-9999.00
At (471150, 173772)	there is a MANHOLE with SHORT NUMBER=1751	COVER=	0.00	INVERT=	-9999.00
At (471181, 173838)	there is a MANHOLE with SHORT NUMBER=1805	COVER=	38.45	INVERT=	35.43
At (471176, 173845)	there is a MANHOLE with SHORT NUMBER=1854	COVER=	38.31	INVERT=	36.21
At (471296, 173496)	there is a MANHOLE with SHORT NUMBER=2455	COVER=	0.00	INVERT=	0.00
At (471291, 173489)	there is a MANHOLE with SHORT NUMBER=2456	COVER=	0.00	INVERT=	0.00
At (471277, 173484)	there is a MANHOLE with SHORT NUMBER=2458	COVER=	0.00	INVERT=	0.00
At (471240, 173547)	there is a MANHOLE with SHORT NUMBER=2502	COVER=	44.93	INVERT=	41.96
At (471237, 173563)	there is a MANHOLE with SHORT NUMBER=2552	COVER=	44.85	INVERT=	42.93
At (471261, 173566)	there is a MANHOLE with SHORT NUMBER=2553	COVER=	44.94	INVERT=	42.74
At (471251, 173529)	there is a MANHOLE with SHORT NUMBER=2556	COVER=	-9999.00	INVERT=	-9999.00
At (471282, 173508)	there is a MANHOLE with SHORT NUMBER=2557	COVER=	-9999.00	INVERT=	-9999.00
At (471252, 173653)	there is a MANHOLE with SHORT NUMBER=2601	COVER=	41.69	INVERT=	38.63
At (471221, 173615)	there is a MANHOLE with SHORT NUMBER=2602	COVER=	44.09	INVERT=	41.59
At (471255, 173662)	there is a MANHOLE with SHORT NUMBER=2651	COVER=	41.08	INVERT=	39.26
At (471235, 173673)	there is a MANHOLE with SHORT NUMBER=2653	COVER=	40.43	INVERT=	39.04
At (471262, 173703)	there is a MANHOLE with SHORT NUMBER=2702	COVER=	38.93	INVERT=	36.87
At (471261, 173705)	there is a MANHOLE with SHORT NUMBER=2752	COVER=	38.90	INVERT=	37.14
At (471262, 173706)	there is a MANHOLE with SHORT NUMBER=2753	COVER=	38.85	INVERT=	37.12
At (471257, 173811)	there is a MANHOLE with SHORT NUMBER=2803	COVER=	38.61	INVERT=	36.58
At (471361, 173460)	there is a MANHOLE with SHORT NUMBER=3451	COVER=	45.34	INVERT=	44.52
At (471302, 173485)	there is a MANHOLE with SHORT NUMBER=3455	COVER=	0.00	INVERT=	0.00
At (471319, 173571)	there is a MANHOLE with SHORT NUMBER=3501	COVER=	45.42	INVERT=	41.65
At (471367, 173577)	there is a MANHOLE with SHORT NUMBER=3502	COVER=	45.59	INVERT=	41.92
At (471310, 173572)	there is a MANHOLE with SHORT NUMBER=3551	COVER=	45.36	INVERT=	43.37
At (471318, 173573)	there is a MANHOLE with SHORT NUMBER=3552	COVER=	45.43	INVERT=	43.40
At (471346, 173577)	there is a MANHOLE with SHORT NUMBER=3553	COVER=	45.49	INVERT=	43.51
At (471338, 173689)	there is a MANHOLE with SHORT NUMBER=3601	COVER=	39.03	INVERT=	36.67
At (471313, 173694)	there is a MANHOLE with SHORT NUMBER=3602	COVER=	38.96	INVERT=	36.25
At (471358, 173694)	there is a MANHOLE with SHORT NUMBER=3651	COVER=	39.09	INVERT=	37.42
At (471363, 173695)	there is a MANHOLE with SHORT NUMBER=3652	COVER=	39.08	INVERT=	37.54
At (471340, 173688)	there is a MANHOLE with SHORT NUMBER=3653	COVER=	39.07	INVERT=	37.54
At (471332, 173692)	there is a MANHOLE with SHORT NUMBER=3654	COVER=	39.02	INVERT=	37.52
At (471317, 173694)	there is a MANHOLE with SHORT NUMBER=3655	COVER=	38.96	INVERT=	37.43
At (471351, 173729)	there is a MANHOLE with SHORT NUMBER=3702	COVER=	38.80	INVERT=	-9999.00
At (471365, 173796)	there is a MANHOLE with SHORT NUMBER=3751	COVER=	42.39	INVERT=	36.71
At (471297, 173541)	there is a MANHOLE with SHORT NUMBER=	COVER=	-9999.00	INVERT=	-9999.00
At (471238, 173653)	there is a MANHOLE with SHORT NUMBER=	COVER=	-9999.00	INVERT=	-9999.00
At (471297, 173536)	there is a MANHOLE with SHORT NUMBER=	COVER=	-9999.00	INVERT=	-9999.00
At (471130, 173552)	there is a MANHOLE with SHORT NUMBER=1502	COVER=	44.36	INVERT=	40.65
At (471131, 173549)	there is a MANHOLE with SHORT NUMBER=1553	COVER=	44.31	INVERT=	41.19
At (471136, 173619)	there is a MANHOLE with SHORT NUMBER=1605	COVER=	42.88	INVERT=	38.69

Printbox (471124,173453)-> (471632,173961)
Central Mapsheet : SU7173NW
User : RIMISSON
Time : Thu Apr 9 15:35:01 2009

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At (471185, 173841)	there is a MANHOLE with SHORT NUMBER=1858	COVER=	38.38	INVERT=	-9999.00
At (471382, 173457)	there is a MANHOLE with SHORT NUMBER=3401	COVER=	45.28	INVERT=	41.81
At (471376, 173463)	there is a MANHOLE with SHORT NUMBER=3450	COVER=	45.35	INVERT=	44.17
At (471490, 173464)	there is a MANHOLE with SHORT NUMBER=4401	COVER=	45.00	INVERT=	41.14
At (471427, 173470)	there is a MANHOLE with SHORT NUMBER=4402	COVER=	45.10	INVERT=	41.57
At (471445, 173460)	there is a MANHOLE with SHORT NUMBER=4451	COVER=	45.02	INVERT=	43.68
At (471446, 173471)	there is a MANHOLE with SHORT NUMBER=4452	COVER=	45.03	INVERT=	43.72
At (471428, 173475)	there is a MANHOLE with SHORT NUMBER=4453	COVER=	45.02	INVERT=	43.81
At (471441, 173459)	there is a MANHOLE with SHORT NUMBER=4454	COVER=	44.93	INVERT=	42.33
At (471444, 173458)	there is a MANHOLE with SHORT NUMBER=4457	COVER=	0.00	INVERT=	0.00
At (471492, 173471)	there is a MANHOLE with SHORT NUMBER=4460	COVER=	0.00	INVERT=	0.00
At (471431, 173584)	there is a MANHOLE with SHORT NUMBER=4501	COVER=	45.54	INVERT=	42.35
At (471420, 173551)	there is a MANHOLE with SHORT NUMBER=4502	COVER=	45.53	INVERT=	-9999.00
At (471446, 173586)	there is a MANHOLE with SHORT NUMBER=4503	COVER=	0.00	INVERT=	-9999.00
At (471411, 173585)	there is a MANHOLE with SHORT NUMBER=4551	COVER=	45.62	INVERT=	43.90
At (471422, 173549)	there is a MANHOLE with SHORT NUMBER=4552	COVER=	45.52	INVERT=	-9999.00
At (471427, 173501)	there is a MANHOLE with SHORT NUMBER=4553	COVER=	0.00	INVERT=	-9999.00
At (471421, 173556)	there is a MANHOLE with SHORT NUMBER=4556	COVER=	-9999.00	INVERT=	-9999.00
At (471417, 173562)	there is a MANHOLE with SHORT NUMBER=4557	COVER=	-9999.00	INVERT=	-9999.00
At (471410, 173562)	there is a MANHOLE with SHORT NUMBER=4558	COVER=	-9999.00	INVERT=	-9999.00
At (471420, 173676)	there is a MANHOLE with SHORT NUMBER=4606	COVER=	41.29	INVERT=	39.93
At (471426, 173639)	there is a MANHOLE with SHORT NUMBER=4652	COVER=	44.08	INVERT=	42.78
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At (471413, 173697)	there is a MANHOLE with SHORT NUMBER=4654	COVER=	39.53	INVERT=	-9999.00
At (471413, 173699)	there is a MANHOLE with SHORT NUMBER=4655	COVER=	39.49	INVERT=	38.06
At (471428, 173622)	there is a MANHOLE with SHORT NUMBER=4656	COVER=	0.00	INVERT=	-9999.00
At (471479, 173679)	there is a MANHOLE with SHORT NUMBER=4659	COVER=	-9999.00	INVERT=	-9999.00
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At (471492, 173727)	there is a MANHOLE with SHORT NUMBER=4705	COVER=	0.00	INVERT=	-9999.00
At (471416, 173727)	there is a MANHOLE with SHORT NUMBER=4706	COVER=	44.01	INVERT=	34.08
At (471492, 173720)	there is a MANHOLE with SHORT NUMBER=4707	COVER=	38.12	INVERT=	-9999.00
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At (471437, 173787)	there is a MANHOLE with SHORT NUMBER=4753	COVER=	0.00	INVERT=	-9999.00
At (471477, 173703)	there is a MANHOLE with SHORT NUMBER=4756	COVER=	0.00	INVERT=	-9999.00
At (471493, 173706)	there is a MANHOLE with SHORT NUMBER=4757	COVER=	-9999.00	INVERT=	-9999.00
At (471492, 173725)	there is a MANHOLE with SHORT NUMBER=4758	COVER=	-9999.00	INVERT=	-9999.00
At (471512, 173460)	there is a MANHOLE with SHORT NUMBER=5401	COVER=	44.99	INVERT=	41.12
At (471551, 173458)	there is a MANHOLE with SHORT NUMBER=5402	COVER=	44.80	INVERT=	40.83
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At (471525, 173485)	there is a MANHOLE with SHORT NUMBER=54NK	COVER=	0.00	INVERT=	0.00
At (471507, 173651)	there is a MANHOLE with SHORT NUMBER=5601	COVER=	44.61	INVERT=	40.83
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At (471473, 173577)	there is a MANHOLE with SHORT NUMBER=5701	COVER=	44.08	INVERT=	39.83
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At (471495, 173631)	there is a MANHOLE with SHORT NUMBER=	COVER=	-9999.00	INVERT=	-9999.00
At (471491, 173525)	there is a MANHOLE with SHORT NUMBER=	COVER=	-9999.00	INVERT=	-9999.00
At (471164, 173483)	there is a MANHOLE with SHORT NUMBER=1405	COVER=	0.00	INVERT=	0.00
At (471165, 173469)	there is a MANHOLE with SHORT NUMBER=1455	COVER=	44.43	INVERT=	42.80

Printbox (471124,173453)-> (471632,173961)
Central Mapsheet : SU7173NW
User : RIMISSON
Time : Thu Apr 9 15:35:01 2009

The position of apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. 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 and established on site before any works are undertaken.

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

At (471181,173880)	there is a MANHOLE with SHORT	NUMBER=1852	COVER=	38.37	INVERT=	-9999.00
At (471150,173822)	there is a MANHOLE with SHORT	NUMBER=1861	COVER=	38.50	INVERT=	36.63
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At (471444,173783)	there is a MANHOLE with SHORT	NUMBER=4701	COVER=	0.00	INVERT=	-9999.00
At (471465,173795)	there is a MANHOLE with SHORT	NUMBER=4703	COVER=	0.00	INVERT=	-9999.00
At (471461,173781)	there is a MANHOLE with SHORT	NUMBER=4704	COVER=	0.00	INVERT=	-9999.00
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At (471511,173589)	there is a MANHOLE with SHORT	NUMBER=5501	COVER=	45.39	INVERT=	0.00
At (471518,173589)	there is a MANHOLE with SHORT	NUMBER=5502	COVER=	45.29	INVERT=	41.75
At (471515,173556)	there is a MANHOLE with SHORT	NUMBER=5503	COVER=	45.17	INVERT=	41.91
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At (471514,173559)	there is a MANHOLE with SHORT	NUMBER=5553	COVER=	45.17	INVERT=	43.99
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At (471552,173569)	there is a MANHOLE with SHORT	NUMBER=5557	COVER=	0.00	INVERT=	0.00
At (471553,173576)	there is a MANHOLE with SHORT	NUMBER=5558	COVER=	0.00	INVERT=	0.00
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At (471624,173593)	there is a MANHOLE with SHORT	NUMBER=65MN	COVER=	0.00	INVERT=	0.00
At (471620,173619)	there is a MANHOLE with SHORT	NUMBER=66LH	COVER=	0.00	INVERT=	0.00
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At (471189,173842)	there is a MANHOLE with SHORT	NUMBER=1804	COVER=	38.41	INVERT=	35.70

Sewer Flooding

History Enquiry



Waterman Transport & Development Infrastructures

Clink Street

Search address supplied Station Hill
Reading
RG1 1NR

Your reference CIV13174 140616 DODTW

Our reference SFH/SFH Standard/2014_2795416

Received date **18 June 2014**

Search date **18 June 2014**

Thames Water Utilities Ltd

Property Searches
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T 0118 925 1504
E searches@thameswater.co.uk
I www.thameswater-propertysearches.co.uk

Registered in England and Wales
No. 2366661, Registered office
Clearwater Court, Vastern Road
Reading RG1 8DB

Sewer Flooding

History Enquiry



Search address supplied: Station Hill, Reading, RG1 1NR

This search is recommended to check for any sewer flooding in a specific address or area

TWUL, trading as Property Searches, are responsible in respect of the following:-

- (i) any negligent or incorrect entry in the records searched;
- (ii) any negligent or incorrect interpretation of the records searched;
- (iii) and any negligent or incorrect recording of that interpretation in the search report
- (iv) compensation payments

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Sewer Flooding

History Enquiry



History of Sewer Flooding

Is the requested address or area at risk of flooding due to overloaded public sewers?

The flooding records held by Thames Water indicate that there have been no incidents of flooding in the requested area as a result of surcharging public sewers.

For your guidance:

- A sewer is “overloaded” when the flow from a storm is unable to pass through it due to a permanent problem (e.g. flat gradient, small diameter). Flooding as a result of temporary problems such as blockages, siltation, collapses and equipment or operational failures are excluded.
- “Internal flooding” from public sewers is defined as flooding, which enters a building or passes below a suspended floor. For reporting purposes, buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.
- “At Risk” properties are those that the water company is required to include in the Regulatory Register that is presented annually to the Director General of Water Services. These are defined as properties that have suffered, or are likely to suffer, internal flooding from public foul, combined or surface water sewers due to overloading of the sewerage system more frequently than the relevant reference period (either once or twice in ten years) as determined by the Company’s reporting procedure.
- Flooding as a result of storm events proven to be exceptional and beyond the reference period of one in ten years are not included on the At Risk Register.
- Properties may be at risk of flooding but not included on the Register where flooding incidents have not been reported to the Company.
- Public Sewers are defined as those for which the Company holds statutory responsibility under the Water Industry Act 1991.
- It should be noted that flooding can occur from private sewers and drains which are not the responsibility of the Company. This report excludes flooding from private sewers and drains and the Company makes no comment upon this matter.
- For further information please contact Thames Water on Tel: 0845 9200 800 or website www.thameswater.co.uk

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Reading RG1 8DB



E. Hoare Lea Below Ground Drainage Design Note

DESIGN NOTE

PROJECT STATION HILL

SUBJECT Below Ground Drainage Design Note

TO Watermans/ Stanhope

AUTHOR Catherine McDonald/ David Matthews

DATE 21st March 2013

OUR REF 0511464

The local below ground drainage infrastructure is owned and maintained by Thames Water Utilities Ltd (TWU). Please note that utility providers do not record privately owned sewers, which have been located (via survey) along Merchants Place. An extract of the TWU asset map is shown below in Figure 1.



Figure 1: Extract from Thames Water record info.

DESIGN NOTE



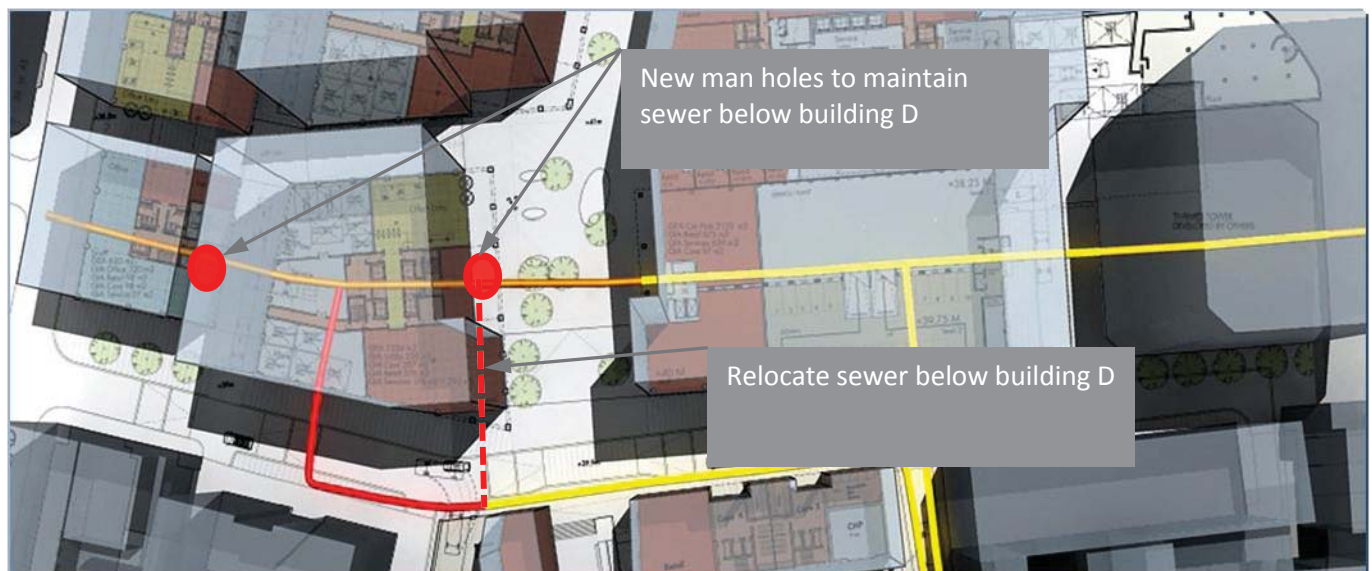
An existing primary combined sewer runs from West to East circa 4m below the existing buildings onsite. The developments above and adjacent to the site connect to this sewer that is considered important to the Thames Water network. The primary sewer has been surveyed and is considered to be on good condition however some of the braches connected to the sewer are in poor condition. In order to develop over the sewer, the architectural and structural designs will need to cater for a 3m (either side of centre line) easement zone and the proposal will need to be accepted by Thames water to allow them to issue a 'Build over agreement' . Some amendments to the existing primary sewer and branches will be required to accommodate the build over agreement. Alternatively, the sewer could be diverted to Garrard Street.

Implications of Sewer Remaining

The sewer is currently built over. However, the proposed buildings, in particular D, will affect the current man-hole access. Therefore TWU will want to enter into a new agreement with the developer to incorporate the following:

- Legal agreement granting an easement to and indemnifying Thames Water.
- The structural solution will need to satisfy TWU's criteria (pile type, location and cover).
- The space planning solution will need to satisfy TWU's criteria (to be agreed, but worse case - full access, 3m min headroom, liftable concrete channel cover, space not for storage of habitable use).

The project team will engage with TWU to see if the above criteria can be met.



DESIGN NOTE

Sewer relocation

TWU have completed a feasibility report as an initial overview to relocating the sewer to Garrard Street. The report contains a number of risks (routing, length of diversion, type of construction, re-convection of existing drains to the sewer etc). The project team need to take ownership of these risks and engage with TWU to see how they can be managed.



To proceed with the design of the sewer diversion to pre-construction stage and arrive at a final contribution cost TWU require payment of £49k. Their advised design period is 20 weeks and 6 weeks to tender and 20 weeks to construct.

Note that the TWU feasibility report does not take into account other services diversion to allow the proposed 1050mm diameter concrete pipe.

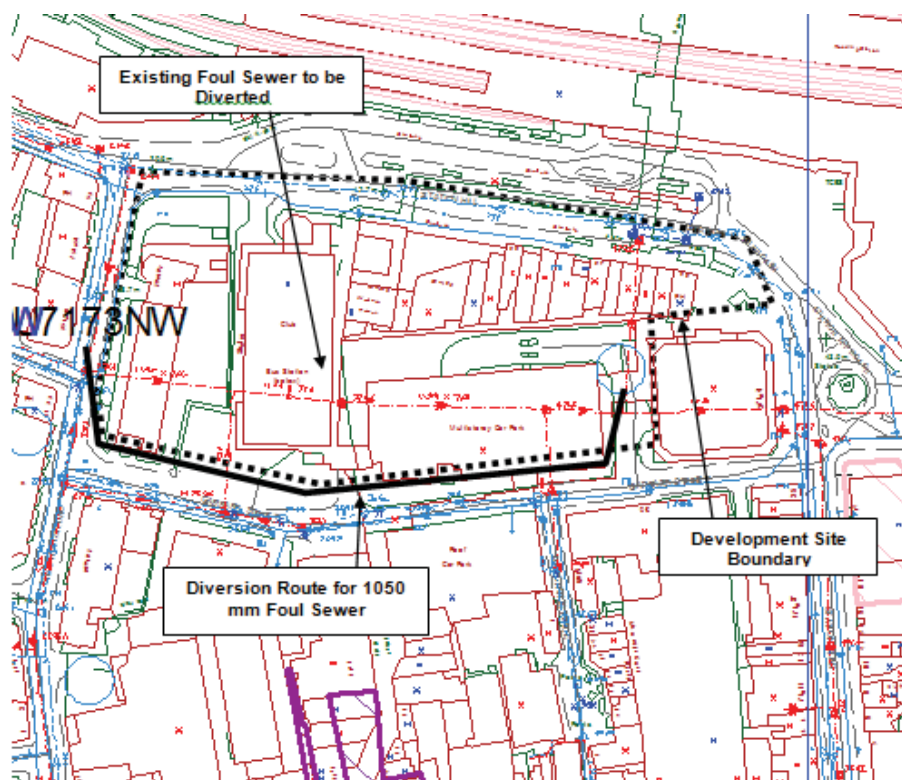


Figure 3: TWU proposed diversion route.

CCTV Survey

To assess the condition of the local sewers, a full CCTV survey has been completed to determine the condition of the existing pipes.

In summary, the main 1150x750mm diameter sewer running west to east is in reasonable condition and is not in need of any major repairs. There is an unidentified tank located below Xafinty House, that needs to be fully traced and decommissioned.

There is a 225mm diameter sewer running east to west along Garrard street before running south to north before proposed building D. This sewer is in poor condition and will need repairing by TWU and relocating to suit the proposed development.

DESIGN NOTE

In addition to the main sewer, the sewers in Friar Street and Merchants Place were also surveyed. The survey highlighted that there are considerable Private sewers along Merchants Place of which most are in poor condition. The TWU sewers were generally in good condition and suitable for amending to accommodate the new supplies.

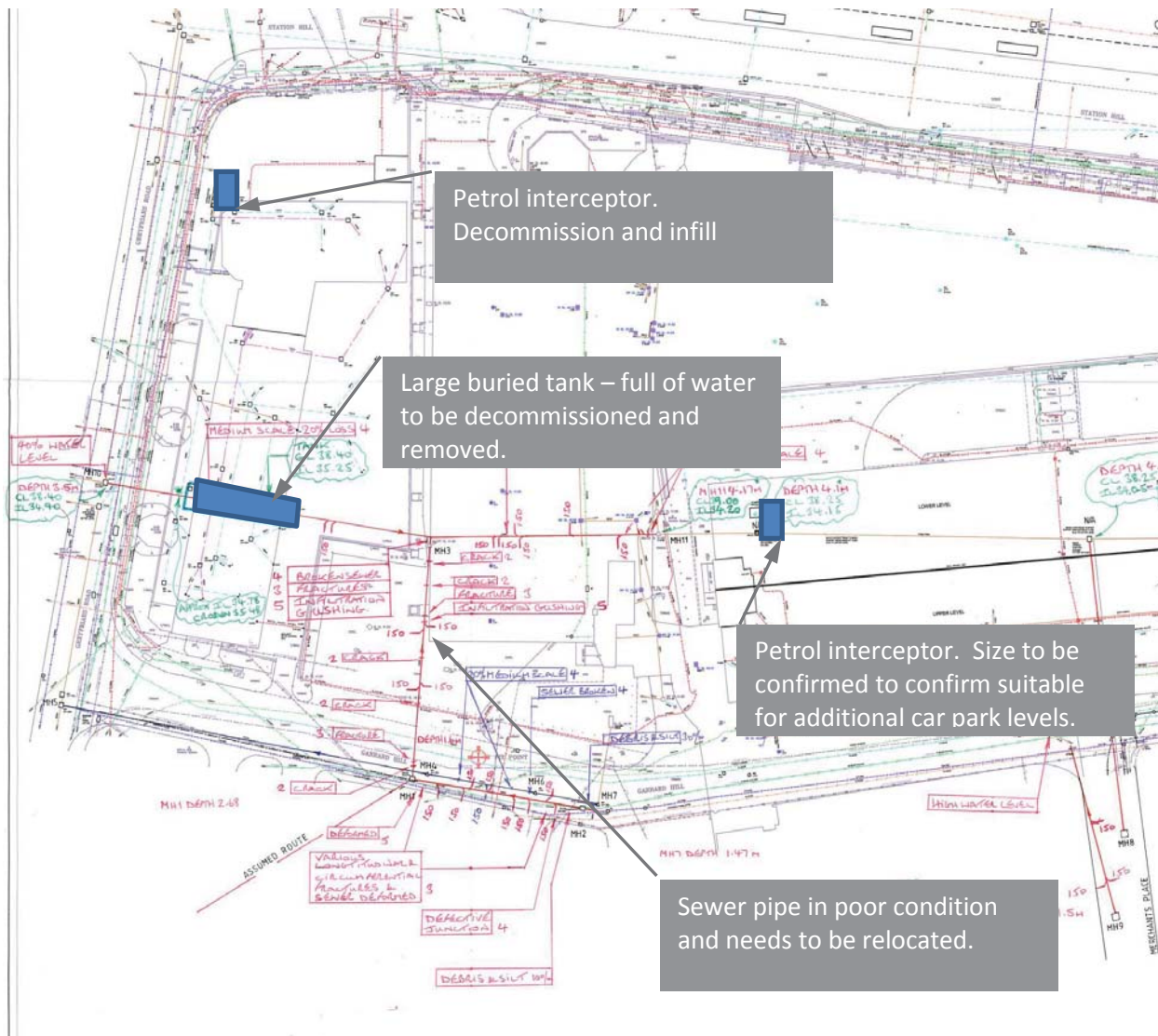
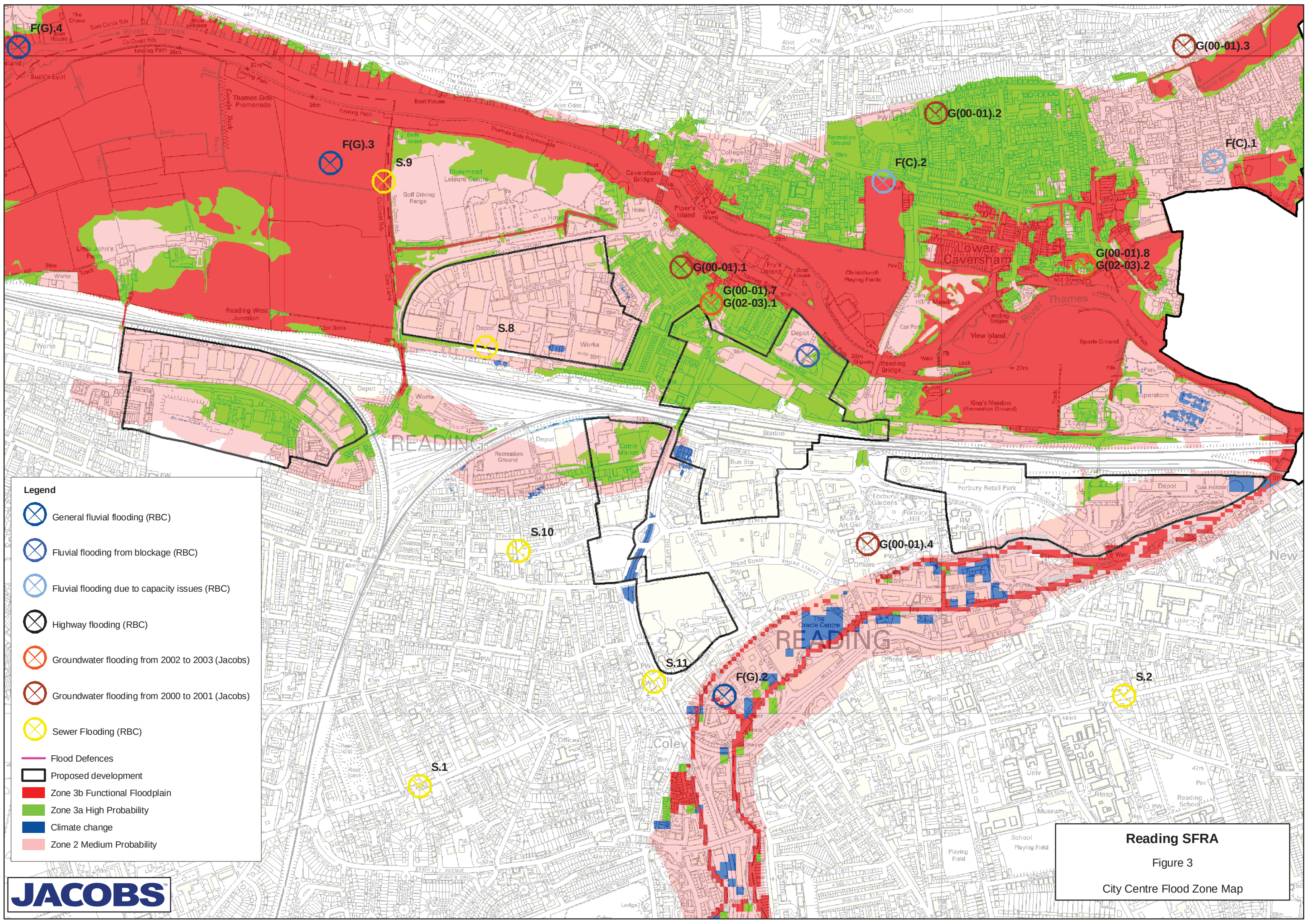


Figure 4: Extract from CCTV survey

F. Reading Council's Strategic Flood Risk Assessment Map



- Legend**
- General fluvial flooding (RBC)
 - Fluvial flooding from blockage (RBC)
 - Fluvial flooding due to capacity issues (RBC)
 - Highway flooding (RBC)
 - Groundwater flooding from 2002 to 2003 (Jacobs)
 - Groundwater flooding from 2000 to 2001 (Jacobs)
 - Sewer Flooding (RBC)
 - Flood Defences
 - Proposed development
 - Zone 3b Functional Floodplain
 - Zone 3a High Probability
 - Climate change
 - Zone 2 Medium Probability

Reading SFRA
Figure 3
City Centre Flood Zone Map



G. Hoare Lea Stormwater Drainage Strategy



Redevelopment of Station Hill & Garrard Street Reading

Stormwater Drainage Strategy – Revision D 13-07-15

1. Background

- 1.1 A large, phased development of the area south of Reading Station is proposed. Existing buildings will be demolished and reconstructed to a different pattern, with areas of hard landscaping breaking up the development into a series of large blocks annotated Blocks A – F(See Figure 1).
- 1.2 This strategy looks at how the whole development can be drained whilst meeting run-off constraints that are likely to be imposed by the approving authorities. There has been a series of communications over a number of years during the gestation of the scheme between Waterman and the Environment Agency (EA) regarding the proposed run-off. The EA have stated that they would wish to see a PPS25 (now superseded by the National Planning Policy Framework (NPPF) and associated technical guidance) approach to the drainage design with allowances for climate change of 30%, based on assuming a 100 year design life for residential elements of the project.
- 1.3 Discussions have taken place between Hoare Lea and Thames Water to establish their outline requirements subject to a formal developer enquiry and/or Section 106 connection application. It has been agreed that for initial design guidance the same parameters as recently approved for a large Hoare Lea project in Bracknell can be assumed. This would limit the discharge to the lesser of the 1 year, 30minute run-off or the surcharged capacity of the existing discharge drain(s).

2. SUDs Options Considered

- 2.1 SUDs Options for this highly urbanised site are limited and the options considered are tabulated as follows:

Option	Site Constraints/Opportunities
Infiltration/Soakaways	The site has a history of previous uses with a potential risk of contamination. Soakaways could mobilise contaminants through creation of groundwater flows. Much of the site will be occupied by foundations for the new structures and with the size of soakaways required, there may be a risk of affecting groundbearing slabs and footings.
Swales or other shallow storage	Insufficient space to create large areas of soft landscaping together with concerns over public safety and ongoing maintenance issues.
Permeable surfaces	Similar perceived risk of contamination mobilisation as the soakaway option. Programming and services installation difficulties with permeable paving build-ups and concerns over long term performance in heavily used public realm areas with regular use of cleaning plant.
Ponds/Wetlands	Insufficient space and concerns over public safety and ongoing maintenance issues.

Option	Site Constraints/Opportunities
Attenuation Storage	Potential option using sealed units positioned away from foundation zones
Green Roofs	Green/brown roofs may help to reduce peak run-off by lengthening the rainfall hydrograph. As a precautionary measure at this stage no allowance for green/brown roofs has been included in the calculations

- 2.2 The above table demonstrates the limited opportunities for true SUDs provision for the new development, the most viable option being attenuation to control and manage the rate of run-off into the receiving drainage system.

3. Design Methodology

- 3.1 Based on the run-off constraints outlined in Section 2 we have developed a stormwater control strategy that considers the phasing proposals and provides a series of individual attenuation volumes and flow controls to serve each development plot. Included in each catchment is an amount of associated hard landscaping/public realm area. Existing adopted highway land has not been included in the calculation of attenuation volumes as it is assumed to drain as existing albeit via renewed gullies and channels forming part of the new paving scheme. The catchment areas used to determine the run-off in each case are shown in Figure 1 and the areas are tabulated below.
- 3.2 To assess the pre development 1 year 30 minute storm run-off we have used the Flood Estimation Handbook (FEH) to establish the appropriate rainfall depth. For comparison we have also calculated the 100 year 30 min. run-off. The results are tabulated in Section 5.
- 3.3 For each catchment we have calculated the range of storage volumes that may be required including a 30% addition to the rainfall figures to account for climate change. This has been done using Microdrainage 'quick storage calculation', which gives an upper and lower range of potential storage. The actual storage will depend on site topography and detailed hydraulic design of the storage and controls. We have run a check on one of the catchments to gauge whether the range of storage volumes is realistic given the actual site levels and using a hydrobrake flow control on the outlet of a typical storage tank. The storage and flow rates correlated fairly accurately so we consider the use of the larger storage volume in the 'quick storage estimate' is a reasonable, slightly conservative approach at this stage in the design process.
- 3.4 The attenuation storage is designed to accommodate a 100year storm event including 30% climate change on the basis that the scheme is seeking a BREEAM 'Excellent' rating, which requires 100 year storage where attenuation needs to be provided. Should any of the storage be adopted, agreement will need to be sought with Thames Water for adoption in excess of the 30 year volume, which is normally their maximum statutory requirement.
- 3.5 In order to establish the approximate plan area of each attenuation storage volume we have assumed the construction would be 1.2m deep using either cellular crates or a proprietary system such as 'Carlow' pre cast concrete tank. The design used will depend on whether the attenuation is to be adopted by Thames Water, who normally do not adopt cellular tanks due to perceived maintenance problems. The tank sizes are tabulated below and indicated in sketch form on the drainage scheme shown in Figure 2.

4. Calculation of Pre development run-off rates

Project: **Station Hill Reading** Date: **June 2014**
OSGR: **E471457 N173667**

The Rational Formula: $Q_p = C_i A$ (formula 7.18 Wallingford Procedure Vol. 1)

Where Q_p = discharge rate

C = Coefficient where $C = C_v \times C_r$ (C_v =volumetric run-off coefficient & C_r =routing coefficient) (formula 7.19)

i = rainfall intensity mm/hr

$\bar{i}$ = mean rainfall intensity mm/hr

A = Area (ha) = (drained hard paved area, refer to drawing CSK2 for zones).

For Q_p in litres per second the formula becomes $Q_p = C_i A \div 0.36$

Determination of C :

From Wallingford Procedure Vol.1 $C_v = 0.9$ for full urbanised catchment and $C_r = 1.3$.
 $\therefore C = 1.17$

The storm duration will be taken as 30 minutes as initially agreed with Thames Water

Determination of i from FEH CD ROM

1 year 30 min. rainfall depth = 11.4mm $\therefore$ mean rainfall for design = 22.8mm/hr

30 year 30 min. rainfall depth = 34.2mm $\therefore$ mean rainfall for design = 68.4mm/hr

100 year 30 min. rainfall depth = 50.5mm $\therefore$ mean rainfall for design = 101mm/hr

5. Post development run-off

- 5.1 The following table shows the 1 year 30min. duration storm run-off rate, the 100 year 30 minute run-off (for comparison) and the range of attenuation storage volumes that result assuming up to the 100 year (1% annual probability) storms are attenuated to match the 1 year 30min flow rate. The resulting storage volumes are indicated in their preliminary locations on the site plan shown in Figure 2.

Plot	Area m2	% imp. area	Imp. area m2	1 yr 30min. discharge l/s	100yr 30min.** discharge (un-attenuated) l/s	Storage min (inc. 30% climate change) m3	Storage max (inc. 30% climate change) m3	Storage width x length x depth(m)	Post development run-off limited to: l/s
A	2397	100	2397	17.76	78.68	47.00	83.00	23x3x1.2	17.76
B	2672	100	2672	19.80	87.71	55.00	96.00	27x3x1.2	19.80
C	4859	100	4859	36.01	159.50	137.00	212.00	34x4x1.5	36.01
D	2119	100	2119	15.70	69.56	39.00	69.00	19x3x1.2	15.70
E	5731	100	5731	42.47	188.12	112.00	197.00	10x17x1.2	42.47
F	2721	100	2721	20.16	89.32	53.00	94.00	5x16x1.2	20.16
** for illustration purposes only									



Figure 1. Drainage Catchment Areas

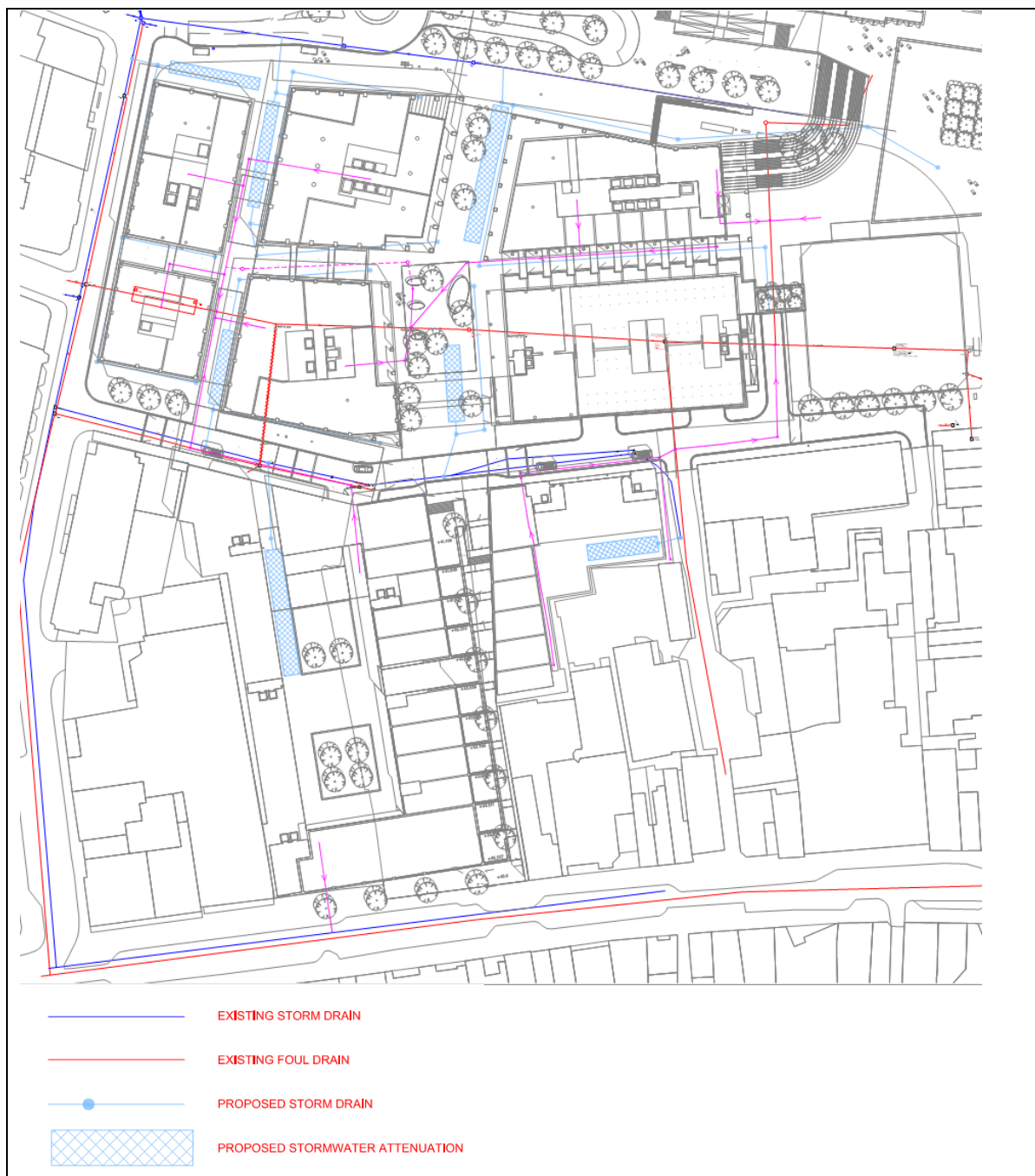


Figure 2. Indicative Storm Drainage Scheme Layout (based on 100yr 30min. max. storage volumes).

UK and Ireland Office Locations





Appendix 13.2

Surface Water Drainage Strategy: Temporary Flexible Events Space (March 2013)

Surface Water Drainage Strategy

Station Hill, Reading - Temporary Flexible Events Space

March 2013

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Surface Water Drainage Strategy

Station Hill, Reading - Temporary Flexible Events Space

Client Name: Sackville Developments (Reading) Ltd
Document Reference: CIV13174 130208
Project Number: CIV13174 (EED12350-109)

Quality Assurance – Approval Status

This document has been prepared and checked in accordance with
 Waterman Group's IMS (BS EN ISO 9001: 2008 and BS EN ISO 14001: 2004)

Issue	Date	Prepared by	Checked by	Approved by
A02	27.03.13	Beata Libiszewska Senior Engineer	Nicole Quail Principal Consultant	Brendan McCarthy Associate Director
Comments		Final report		
Issue	Date	Prepared by	Checked by	Approved by
A01	12.03.13	Beata Libiszewska Senior Engineer	Nicole Quail Principal Consultant	Brendan McCarthy Associate Director
Comments		Draft for legal review		

Our Markets



Property & Buildings



Transport & Infrastructure



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Environment

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1. Introduction

- 1.1. Waterman have been commissioned to provide a surface water strategy for the Temporary Flexible Event Space at the Station Hill, in Central Reading. The site location is given in Figure 1, and hereafter referred to as the 'Site'). The National Grid Reference for the site is 471400, 173760.

2. Site Description

- 2.1. The Site is located directly to the south of the Reading Mainline Station in Reading town centre and is centred on National Grid Reference (NGR) 471388 173767. The Site has an area of approximately 0.35 hectares (ha) and is bound by:
- Station Hill and Reading Mainline Station to the north;
 - NCP Car Park and Garrard Street to the south;
 - Former central bus station and former vacant bingo hall above to the west; and
 - The vacant eleven storey Thames Tower office building to the east.
- 2.2. The existing Site comprises of two largely vacant buildings: a low rise building orientated in east-west direction and the Western Tower building, as shown on Figure 1 in Appendix A. The remainder of the Site is covered by tarmac. The Site is currently 100% impermeable
- 2.3. The topographic survey shows that the Site slopes in south-westerly direction;
- from 47.3m AOD to 42.3m AOD along the southern boundary; and
 - from 46.8m AOD to 41.8m AOD from north to south.

3. Development Proposal

- 3.1. The proposals for the Site (hereafter referred to as the 'Development') comprise a temporary flexible event space to be provided prior to the proposed redevelopment of the wider Station Hill site. The proposals comprise demolition of the former Station Hill retail parade (including 26 to 58 Station Hill) to create a landscaped area and multipurpose events platform for temporary uses (Use Classes A1 to A5, D1, D2 and *Sui Generis*). In addition, works of hard and soft landscaping and other incidental works are proposed.
- 3.2. The proposed Development is shown in Figure 2 in Appendix A.
- 3.3. It is proposed that 0.02 ha of the Site would comprise a raised lawn with further 0.027ha planted along the southern edge of the Site. As a result of this, the area of hard landscaping will decrease by 13.4% from the existing situation.

4. Surface Water Drainage

Current Drainage Regime

- 4.1. It is assumed from the contours shown on the masterplan (Appendix A) that surface water currently discharges into the Thames Water via surface water sewers located immediately to the north and east of the Site.
- 4.2. A 300mm diameter surface water sewer which serves the existing Site runs along Station Hill and Station Approach in a westerly direction.

Proposed Drainage Regime

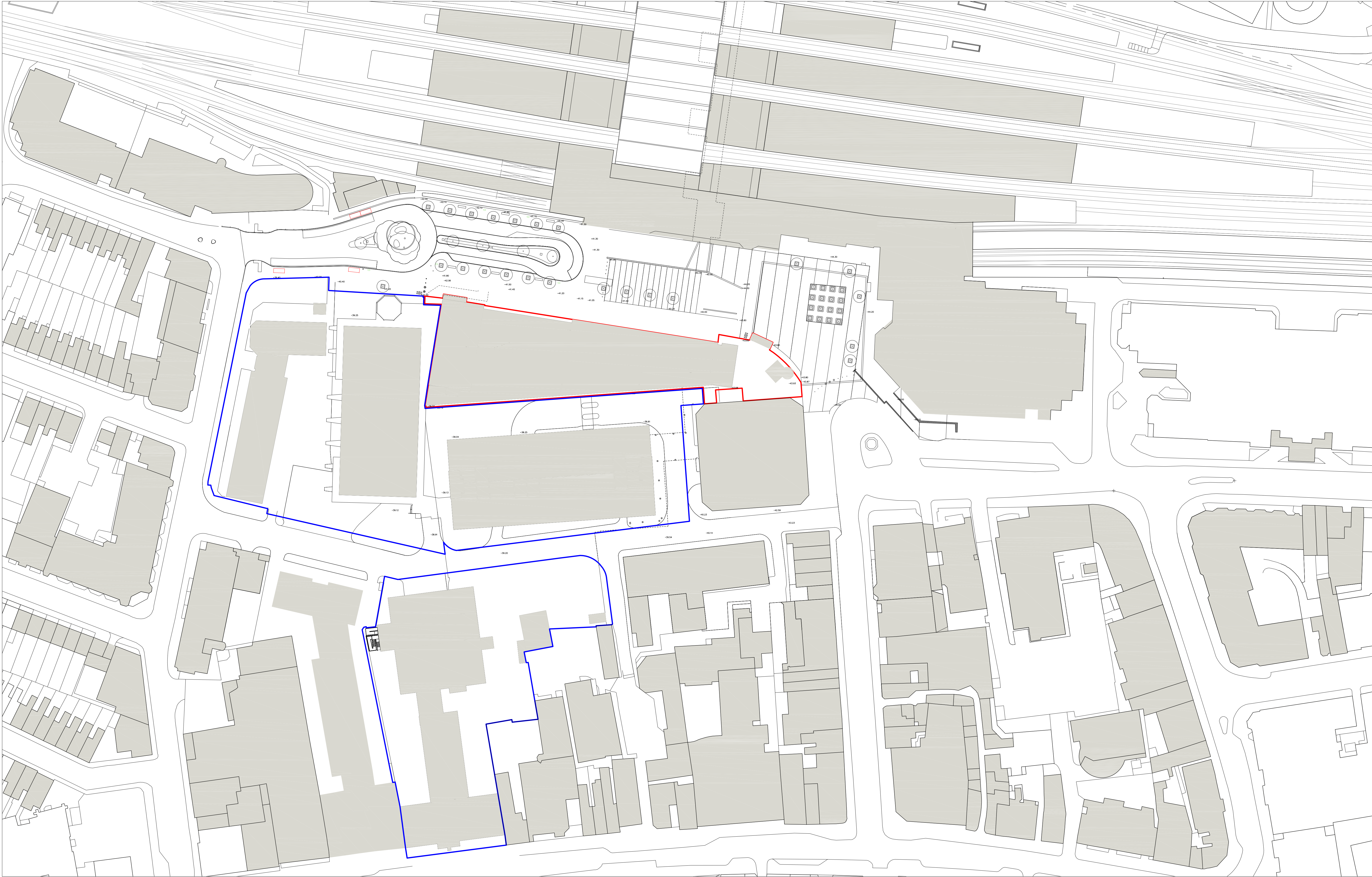
- 4.3. It is proposed to mimic the existing situation post development, and drain surface water from the Development to the public surface water sewers in Station Hill. See Appendix B for Thames Water Assets Plans.
- 4.4. In order to ensure that flood risk to others is not increased, the rate of surface water runoff into the surface water sewer would be restricted to the existing rate.
- 4.5. This approach was confirmed by the Environment Agency which was consulted in January 2012 as part of the planning proposals for permanent development of the wider Station Hill Site. The EA stated in their email appended in Appendix C that they would accept the NPPF/PPS25 approach of limiting the future discharge to existing rate but account for climate change. It is considered that this approach would also be acceptable for the temporary works.
- 4.6. As the site use is temporary, with an expected lifespan of approximately 5 years, no climate change allowance is considered necessary. In any case, the existing Site is wholly hard landscaped and the proportion of hard standing post development would decrease by approximately 13.4%. As such, the volume of surface water run-off entering the sewer would decrease proportionally. This increase in soft landscaping would account for any increase in rainfall intensity for the duration of lifetime of this temporary proposal. The proposed drainage plan prepared by Hoare Lea is shown in Appendix D.
- 4.7. Given the temporary nature of the event space, source control SuDS such as permeable paving were considered to be unsuitable.

5. Conclusions

- 5.1. It is assumed that surface water runoff from the Site drains to the existing public sewers along Station Hill and Station Approach.
- 5.2. Any proposed drainage strategy would mimic this existing situation, ensuring that discharge is restricted to the existing run-off rate. Any increase in rainfall intensity will be counterbalanced by the 13.4% decrease in hard landscaping which will be more than adequate to account for the impacts of climate change for the lifetime of the development assumed to be approximately 5 years. The proposed Development would therefore result in an overall decrease in surface water run-off and decrease the risk of flooding elsewhere.
- 5.3. The EA confirmed in January 2012 that this approach was appropriate for the wider Station Hill Site; it is assumed that this would also apply for the temporary flexible use development.

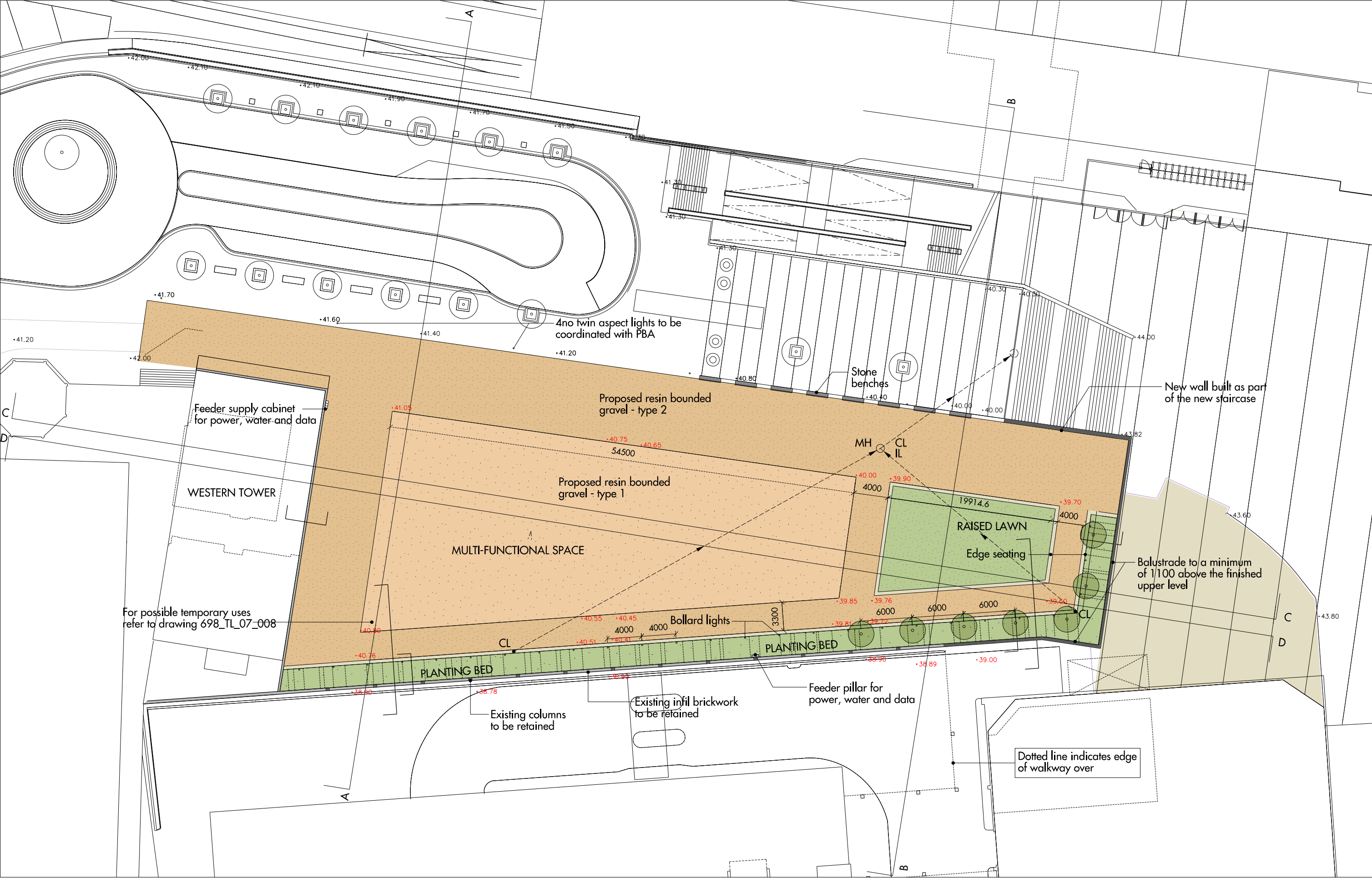
APPENDICES

A. Development Proposals



	Use figured dimensions only. Figured dimensions are in millimetres. All levels are in metres. All dimensions and levels shall be verified on site before proceeding with works. Detailed site survey to be carried out to verify positions and level relationships with site features and ordnance survey. The architect must be notified of any discrepancy. Where building components are described in the specification as contractor designed, "construction" information relating to those components on this drawing represents design intent only.			
	REV	DATE	DESCRIPTION	CKD

- APPLICATION BOUNDARY
- ADJACENT LAND OWNED BY THE APPLICANT



Do not scale from this drawing. Use figured dimensions only. Figured dimensions are in millimetres. All levels are in metres. All dimensions and levels shall be verified on site before proceeding with works. Detailed site survey to be carried out to verify positions and level relationships with site features and ordnance survey. The architect must be notified of any discrepancy. Where building components are described in the specification as contractor designed, "construction" information relating to those components on this drawing represents design intent only.

REV	DATE	DESCRIPTION	CKD

- APPLICATION BOUNDARY
- PROPOSED LEVEL
- PYRUS CHANTECLEER

- PROPOSED RESIN BOUNDED GRAVEL - TYPE 1
- PROPOSED RESIN BOUNDED GRAVEL - TYPE 2
- NEW PAVING TO MATCH EXISTING
- RAISED LAWN
- PLANTING
- ASSUMED DIRECTION GRADIENT

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info@alliesandmorrison.co.uk
A&M JOB NO: 698

STATION HILL READING - TEMPORARY LANDSCAPE
PROPOSED PLAN
PLANNING APPLICATION
698_TL_07_007
SCALE 1:100 @A1 1:200@A3
DRAFT 13.12.2012