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Technical Note

Site 2 – Lytchett Matravers, Dorset

Highways, Flood Risk, Drainage and Utilities Technical Note

Project No.	0657
Revision	B
Date	27 October 2017
Client	Wyatt Homes
Prepared	T Ball / A Hanks
Checked	C Yalden / A Wozniczko
Authorised	I Awcock
File Ref.	P:\0657 Purbeck promotion sites for Wyatt\C Documents\Reports\0657 Site 2 (Purbeck Promotion Sites)- Highways, Flood Risk, Drainage and Utilities - Technical Note.docx

1 Introduction

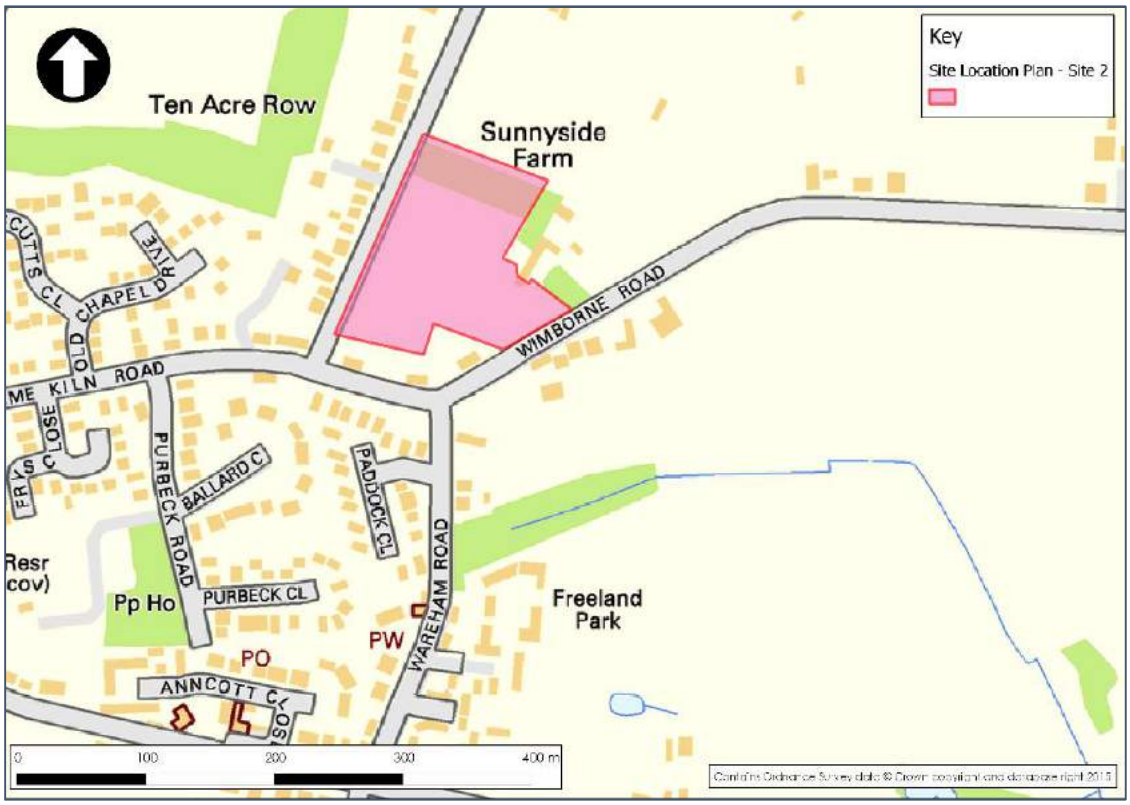
1.1 Wyatt Homes are reviewing opportunities for the promotion of new residential development, comprising of approximately 30 dwellings, on greenfield land to the east of Flowers Drove Lytchett Matravers, Dorset. A copy of the proposed framework masterplan is included within Appendix A of this technical note.

1.2 This Technical Note has been prepared to support the proposed allocation of the site within the emerging Partial Review Local Plan. It identifies existing highways, flood risk, drainage and utility opportunities and constraints, and proposes preliminary strategies for access and drainage to facilitate development at the site.

2 Site Location

2.1 The site, as shown by Figure 2.1 below, is located on land to the east of Flowers Drove and the west of Wimborne Road, towards the eastern extents of Lytchett Matravers, at National Grid Reference SY 947 957.

Figure 2.1 – Site Location plan



3 Existing land uses

3.1 The existing site comprises undeveloped greenfield land with established hedgerows forming boundaries within the site and at its perimeter. The site comprises three existing fields, referred to as 'northern, 'eastern' and 'western' through this report. Within the northern extents of the site there is a small woodland area.

4 Surrounding land use

4.1 The site is surrounded by the following existing land uses:

- To the north lies undeveloped greenfield land.
- To the east lies Wimborne Road and a small number of existing properties and agricultural buildings associated with Sunnyside Farm.

- To the south are residential properties on Lime Kiln Road and Wimborne Road.
- To the west are existing residential properties on Flowers Drove.

5 Topography

5.1 A topographic survey has been undertaken and indicates that the eastern area of the site falls in a westerly direction, from a high point of 81m above ordnance datum (AOD), to a low point of 78m AOD, with an average gradient of 1 in 34.

5.2 The western area of the site falls in a north-westerly direction, from a high point of 78m AOD to a low point of 73m AOD, with an average gradient of 1 in 19.

5.3 These areas offer a relatively shallow grade, unlikely to require any significant earthworks or retaining elements to accommodate future development.

5.4 The northern area of the site falls in a westerly direction, from a high point of 80m AOD to a low point of 73m AOD, with an average gradient of 1 in 10. This is relatively steep and will likely require a degree of localised earthworks and retaining structures to support future development.

5.5 A copy of the existing site survey has been included within drawing 0657-CNS-102 attached as Appendix B of this technical note.

6 Transport, Access and Movement

6.1 The site is located immediately to the east of Flowers Drove towards the north of Lytchett Matravers. The site also benefits from direct frontage along Wimborne Road to the south/east. Figure 6.1 (included within Appendix C of this Technical Note) highlights the location of the site with respect to existing local facilities in Lytchett Matravers with approximate walking distances/times.

6.2 The centre of Lytchett Matravers is located approximately 400m (5 minutes' walk) to the south of the site. This includes a number of local facilities including a Tesco Convenience store, post office, library, GP surgery, pharmacy, and Parish Hall.

6.3 The local Primary School is located on Wareham Road within around 900m (11 minutes' walk) of the site, together with further convenience retail opportunities.

6.4 The nearest bus stop is positioned on Lime Kiln Road around 50m (less than 1 minutes' walk) the site. This is served by bus route 10 which provides an hourly

service between Lytchett Matravers and Poole town centre (via Poole railway station) throughout the day.

6.5 For secondary education, the site falls within the catchment of Lytchett Minster School approximately 1.5km to the south east of Lytchett Matravers. This is accessible by school bus service 718 which also departs from the Lime Kiln Road stop.

6.6 In summary, the site is considered to be accessible to a range of local facilities in Lytchett Matravers within a reasonable walking distance, including primary education, convenience retail and health services. The existing public transport links to Lytchett Minster School and Poole Town Centre would also provide good opportunities to travel to larger education, retail, employment and health facilities further afield using a sustainable mode of travel. Clearly, development at the site would generate an increase in potential patronage for local bus services that would help to underpin their viability.

6.7 The site is therefore considered to be positioned in an accessible location as required by the NPPF, and that there would be good opportunities for residents to use sustainable modes of travel to meet their everyday needs.

6.8 The site's frontage along Flowers Drove extends to 170m. However, the carriageway width along Flowers Drove is relatively narrow and limited to around 4.5m along the majority of the section passing the site. There is also no footway present, and pedestrians accessing the existing properties to the west of the street currently share the highway space with vehicular traffic.

6.9 The site's frontage along Wimborne Road is more limited at 65m in length. However, the carriageway width along Wimborne Road is more generous at around 6m, and footways are present along both sides of the street. A new junction at the Wimborne Road frontage is therefore likely to provide the preferred means of providing a vehicular access to the site, and drawing SK-03 attached as Appendix D of this Technical Note shows how this could be achieved by means of a simple priority junction. This includes visibility splays of 2.4 x 43m in line with Manual for Streets Guidance for 30mph traffic (which reflects the existing speed limit for the road).

6.10 Pedestrian access to the site could be provided at the same location by means of a new footway adjacent to the main access road. This would connect with the existing footway on the northern side of Wimborne Road. Access to the village centre and primary school beyond to the south could then be achieved using the existing footway network at Lime Kiln Road, Wareham Road, Purbeck Road and Purbeck Close.

6.11 There is also the potential for a secondary pedestrian access to be provided to Flowers Drove if the existing footway at the junction with Lime Kiln Road were to be extended along the highway verge into the site at the location of the existing field gate.

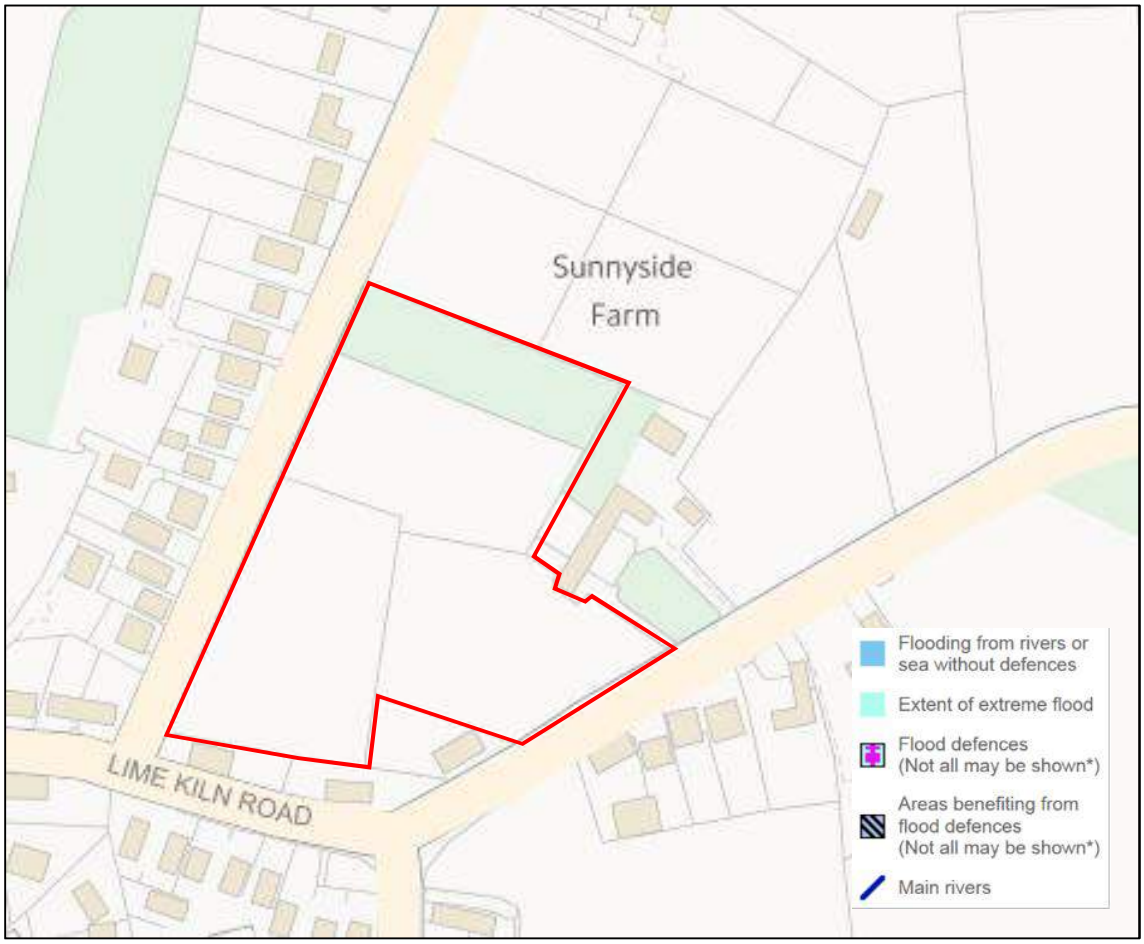
6.12 It is therefore considered that a safe and suitable means of access to the site could be provided as required by the NPPF.

6.13 Existing traffic flows within Lytchett Matravers are anticipated to be relatively low, and it is considered that the development of the site is unlikely to result in a significant change in traffic conditions in the centre of the village or offer the potential for any severe traffic impacts.

7 Flood Risk

7.1 An extract of the Environment Agency's (EA) 'Flood Risk from Rivers or Sea' mapping is reproduced below as Figure 7.1. This mapping shows the entire site to be within Flood Zone 1, as land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%).

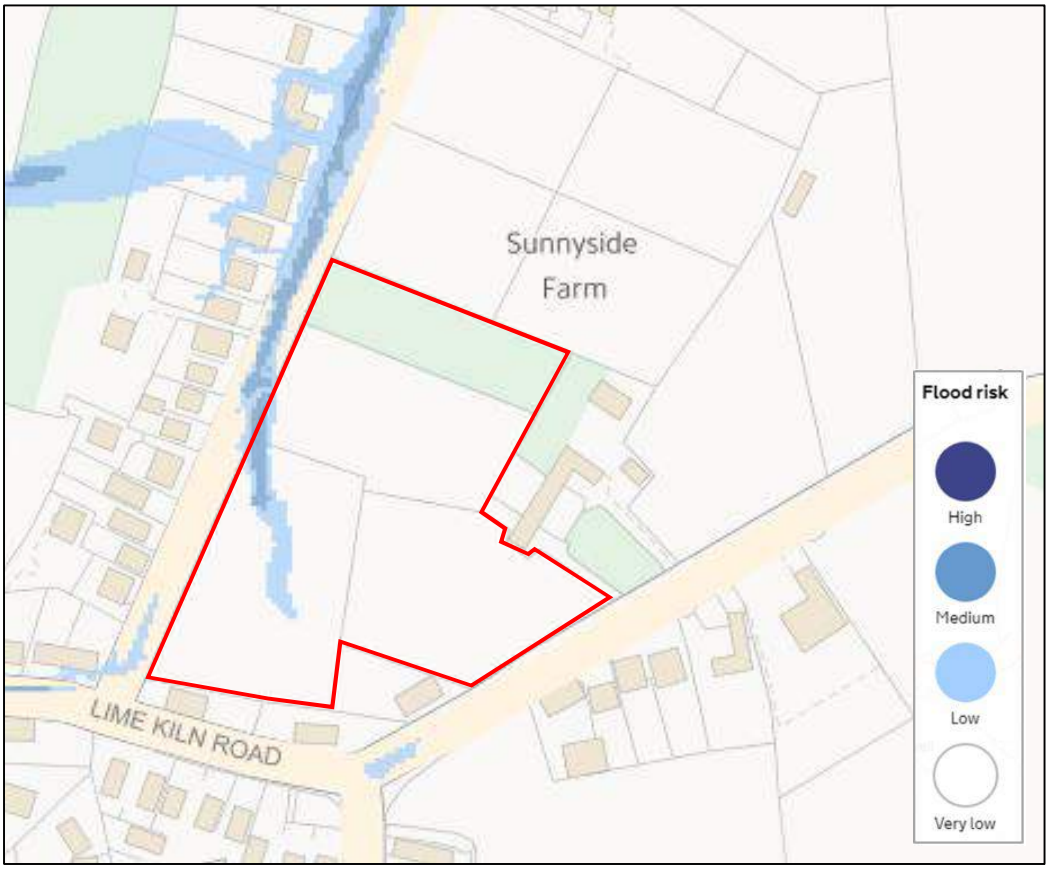
Figure 7.1 – Flood Risk from Rivers or Sea



7.2 The EA's 'Flooding from Surface Water' mapping (Figure 7.2) indicates that the majority of the site is within an area at very low risk of flooding from surface water (less than 0.1% chance of flooding each year), with the exception of a narrow corridor within the western site area, which is at low and medium risk of flooding from surface water (between 0.1 and 3.3% chance of flooding each year).

7.3 The narrow corridor represents a valley through the centre of the western field which conveys rural runoff northwards, towards Flowers Drove. Given that this catchment would be developed, the rural catchment would be reduced and rainfall managed within a new drainage network. Due to this it is considered that this existing flood risk would be mitigated through future development.

Figure 7.2 – Flood Risk from Surface Water map



Existing site drainage

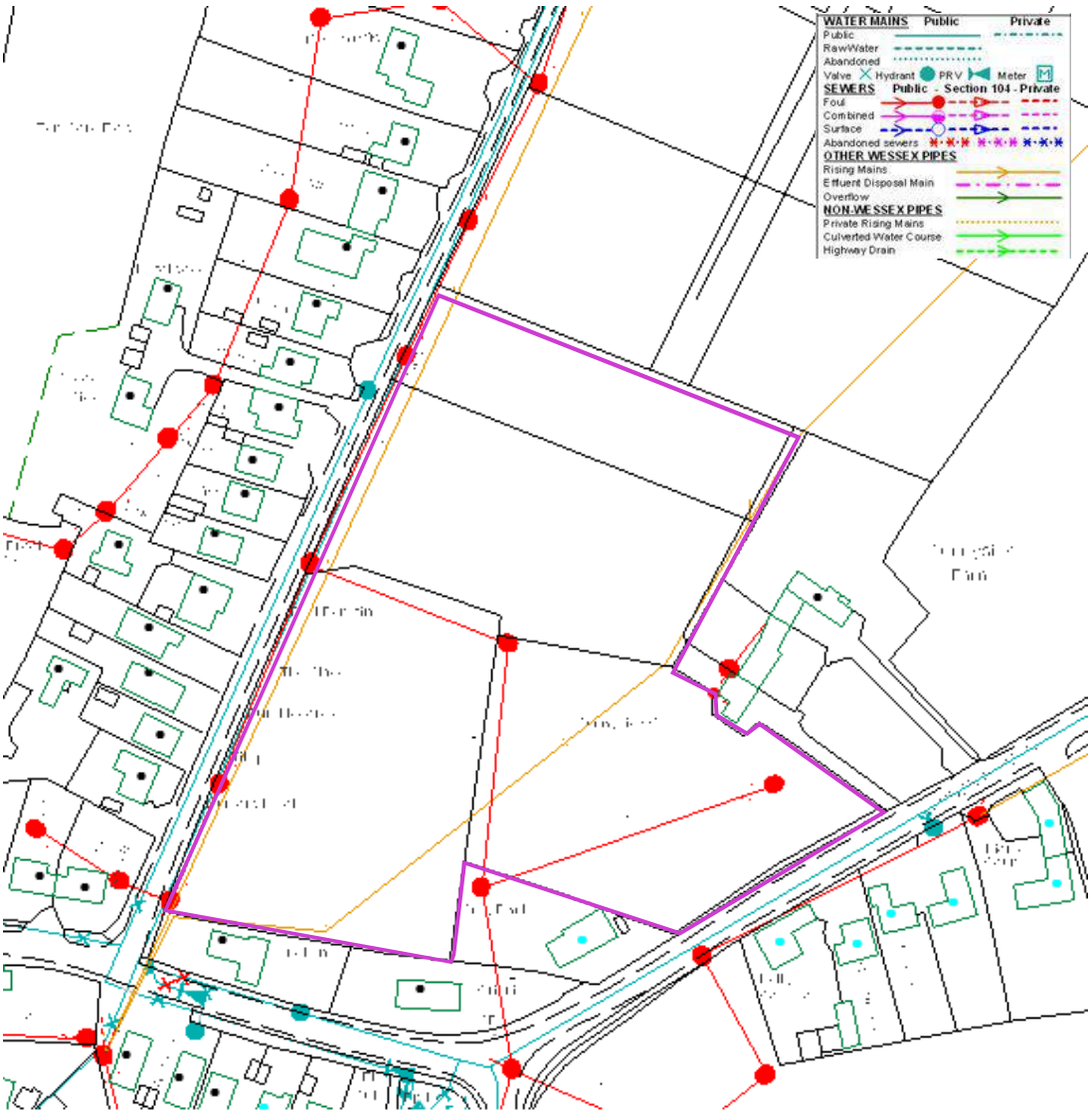
7.4 The topographical survey does not indicate any existing drainage within the site. Greenfield runoff generated by the site follows the natural lie of the land before flowing across Flowers Drove and through greenfield land to the north-west (potentially within existing field ditches), eventually discharging to an existing watercourse, approximately 500m north of the site.

Existing drainage infrastructure

7.5 An extract of the Wessex Water (WW) asset record data for this area has been included as Figure 7.3 of this report. The records show numerous 150mm diameter foul sewers and rising mains at the boundaries to the site and also through its centre.

7.6 If this infrastructure is to be retained (and not diverted) it would need to be accurately traced, with no buildings permitted within 3m of sewers and 6m of rising mains, and with no tree planting permitted within 6m of either.

Figure 7.3 – Wessex Water's asset database



Ground conditions

7.7 A ground investigation has yet to be undertaken. However, a desktop review of the Soilscape Dataset indicates that the site is underlain by 'slightly acid loamy and clayey soils with impeded drainage' and therefore soakaways are unlikely

to present a viable method of surface water disposal for this site. Instead, on-site attenuation combined with off-site discharge is considered to be the most appropriate drainage solution.

7.8 Confirmation of the drainage characteristics would need to be verified by BRE Digest 365 compliant soakaway testing in advance of a Flood Risk Assessment to support any future planning application for this site.

Proposed foul water drainage

7.9 Due to the site topography and location of existing sewers, the full extents of any future development will be able to discharge to the existing 150mm diameter foul network within the site.

7.10 Wessex Water have confirmed that this network has adequate capacity to receive foul flows from the site however the exact point of connection will need to be agreed within Wessex Water once a detailed site layout is available.

7.11 A copy of any correspondence with Wessex Water has been included within Appendix E.

Proposed surface water drainage

7.12 The proposed developable area for this site has been established through consultation with NEW Masterplanning and includes consideration towards any existing topographical, utility and arboricultural constraints.

7.13 The pre-development greenfield run-off rate has been estimated using the MircoDrainage Source Control module, ICP SUDS method. This method is based on the IH 124 methodology, which is the best practice for greenfield sites.

7.14 A copy of the greenfield run-off assessment can be seen within Appendix F of this technical note, results have been summarised in Table 1 below;

Table 7.1 – Greenfield Runoff Rates

Return Period	Greenfield Runoff Rate (l/s)
2yr	4.7
30yr	12.2
100yr	17.1

7.15 To ensure any future development would be safe from flooding throughout its lifetime and that flood risk elsewhere is not increased, the greenfield runoff rates above must be replicated or reduced. This is achieved through the attenuation of surface water runoff within the site.

7.16 To calculate the attenuation storage requirements, it has been assumed that 60% of the developable area will be impermeable catchment. This offers a slightly conservative approach but is common practice until a site layout is available, allowing impermeable catchments to be measured more accurately.

7.17 The MircoDrainage Source Control module has been used to estimate the storage requirements for the proposed scheme. This modelling procedure also includes an allowance for the Long-Term Storage volume, which aims to mitigate the impact of any increased volume of runoff, and has been calculated using equation 24.10 of CIRIA C753, shown within Appendix F of this technical note.

7.18 The output of the MicroDrainage model can be seen within Appendix F of this technical note with results summarised in Table 7.2 below;

Table 7.2 – Attenuation Storage Requirements

Proposed Attenuation Feature	Storage Volume (m^3)
Detention Basin	500
TOTAL	500

7.19 The attenuation storage volume must be provided within the application boundary. This storage can be provided as a single feature near the low point of the site, as reflected by drawing 0657-CNS-102 within Appendix B of this technical note, or it could be sub-divided into several smaller features if the site layout allows and this is a preferred approach.

7.20 The peak rates of discharge will be managed by a series of hydraulic controls, with the restricted outflow being requisitioned off-site to the nearest available point of discharge. Based on the available information, this could be as far as the existing minor watercourse, approximately 500m north of the site – unless discharge to a more local field ditch can be agreed with the respective landowner.

8 Utilities

8.1 An existing utility search was commissioned in May 2017 to establish which utility providers hold assets within the locality of the site.

8.2 The records received in response to this search show an existing BT overhead (OH) cable passing through the eastern area of the site.

8.3 Wimborne Road, Lime Kiln Road and Flowers Drove contain multiple services, including underground (UG) low pressure (LP) gas main, UG Virgin Media

telecoms, UG Wessex Water (WW) water supply main and an OH low voltage (LV) SSE cable.

8.4 The existing utility records have been transposed on to drawing 0657-CNS-102 within Appendix B of this technical note.

8.5 Aside from the foul infrastructure and OH BT cable, no additional utility services are known to pass through the development site. It is likely that below ground diversion of the BT cable would will be required to suit any proposed development within the site.

8.6 We are currently liaising with utility providers to verify whether the existing available services have capacity to accommodate a development of this nature and to provide budget estimates for any likely diversion or reinforcement works.

8.7 The utility supply sheet included within Appendix G of this Technical Note, provides a summary of the utility responses received to date.

9 Conclusion

9.1 The site is considered to be accessible to a range of local facilities in Lytchett Matravers within a reasonable walking distance, including primary education, convenience retail and health services. The existing public transport links to Lytchett Minster School and Poole Town Centre would also provide good opportunities to travel to larger education, retail, employment and health facilities further afield using a sustainable mode of travel.

9.2 The site is therefore considered to be positioned in an accessible location as required by the NPPF, and that there would be good opportunities for residents to use sustainable modes of travel to meet their everyday needs.

9.3 A new simple priority junction at the Wimborne Road frontage is likely to provide the preferred means of providing a vehicular access to the site. Pedestrian access to the site could be provided at the same location to connect with the existing footway on the northern side of Wimborne Road.

9.4 There is also the potential for a secondary pedestrian access to be provided to Flowers Drove if the existing footway at the junction with Lime Kiln Road were to be extended along the highway verge into the site at the location of the existing field gate.

9.5 It is therefore considered that a safe and suitable means of access to the site could be provided as required by the NPPF.

9.6 Existing traffic flows within Lytchett Matravers are anticipated to be relatively low, and it is considered that the development of the site is unlikely to result in a significant change in traffic conditions in the centre of the village or offer the potential for any severe traffic impacts.

9.7 A topographic survey has been undertaken and indicates that the eastern and western areas of the site have average gradients of 1 in 34 and 1 in 19 respectively; these are a relatively shallow grade and are unlikely to require any significant earthworks or retaining elements to accommodate future development. The northern area of the site has an average gradient of 1 in 10; this is relatively steep and will likely require a degree of localised earthworks and retaining structures to support future development.

9.8 The EA's 'Flood Risk from Rivers or Sea' mapping shows the entire site to be within Flood Zone 1, as land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%).

9.9 The EA's 'Flooding from Surface Water' mapping shows the majority of the site to be at 'very low risk' of flooding from surface water, with less than 0.1% chance of flooding each year. The area susceptible to flooding from surface water would be mitigated through the development of the site.

9.10 A ground investigation has yet to be undertaken. However, a desktop review of the Soilscape Dataset indicates that the site is underlain by 'slightly acid loamy and clayey soils with impeded drainage' and therefore soakaways are unlikely to present a viable method of surface water disposal for this site.

9.11 Confirmation of the drainage characteristics would need to be verified by BRE Digest 365 compliant soakaway testing in advance of a Flood Risk Assessment to support any future planning application for this site.

9.12 The storm water runoff attenuation requirement must be provided within the application boundary as either a single feature (as shown on the current constraints plan), or as a series of smaller features, subject to final site layout and client preference.

9.13 The peak rates of storm water discharge will be managed by a series of hydraulic controls, with the restricted outflow being discharged off-site via a sewer requisition to the nearest available watercourse (potentially up to 500m from the site boundary).

9.14 A site-specific FRA will be prepared to support a future planning application which will conclude that the development will be safe from flooding for its design life and not increase the flood risk to any third parties.

9.15 Due to the site topography and location of existing sewers, the full extents of any future development will be able to discharge to the existing 150mm diameter foul network within the site.

9.16 Wessex Water have confirmed that this network has adequate capacity to receive foul flows from the site however the exact point of connection will need to be agreed within Wessex Water once a detailed site layout is available.

9.17 An existing utility search was commissioned in May 2017 to establish which utility providers hold assets within the locality of the site. The records show that a BT overhead cable currently routes across the eastern extents of the site, whereas

9.18 Wimborne Road, Lime Kiln Road and Flowers Drove contain multiple services, including underground low pressure gas main, Virgin Media telecoms, South West Water supply main, BT telecoms and overhead low voltage SSE cable.

9.19 We are currently liaising with utility providers to verify whether the existing available services have capacity to accommodate a development of this nature and to provide budget estimates for any likely diversion or reinforcement works.

AWP

Appendix A Proposed Framework Masterplan

Wimborne Road

0 20m 40m

Sunnyside Farm
Lytchett Matravers
Wyatt Homes

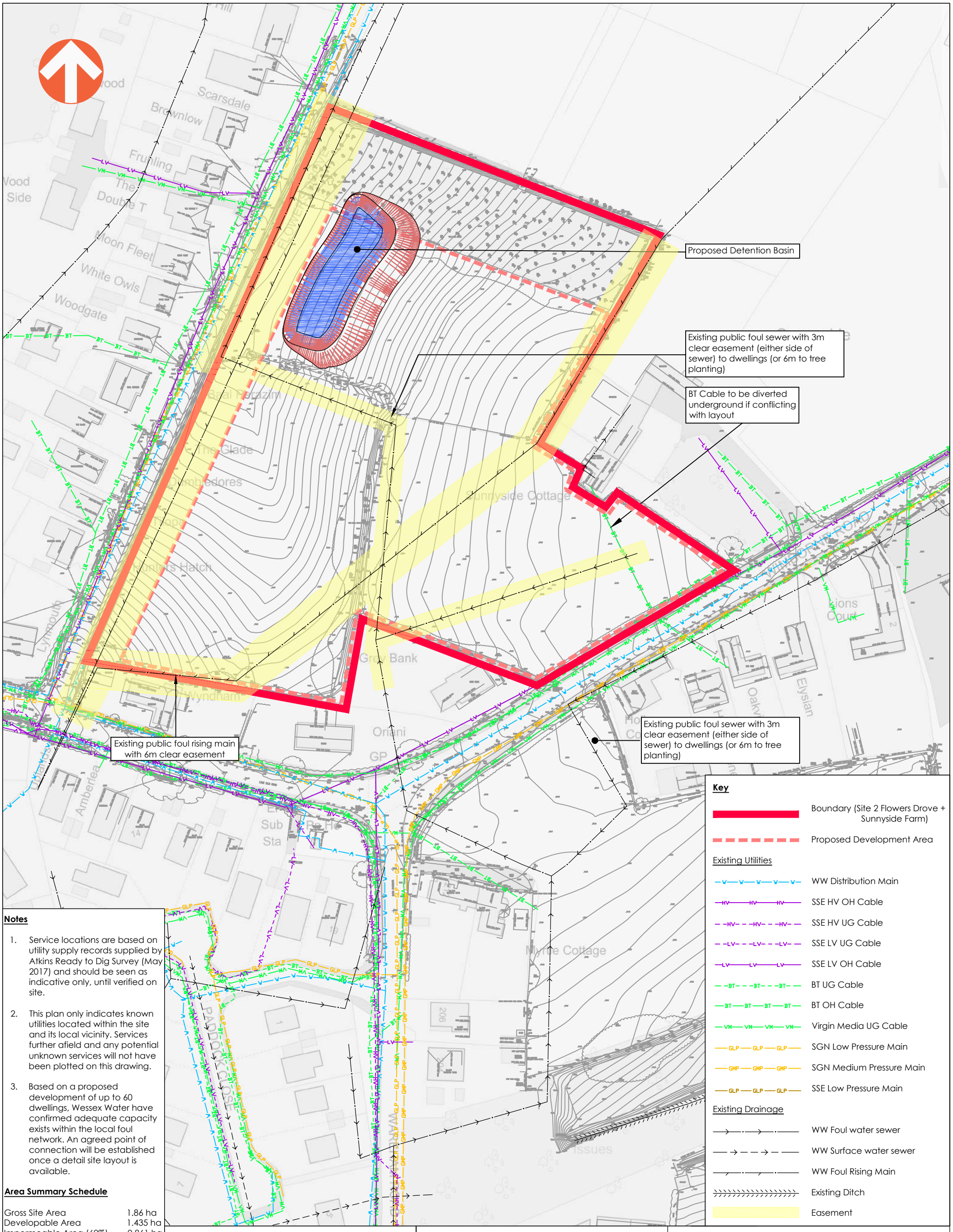
Framework Masterplan

Drwg. no: 121_DI_04.3

2017-07-11
1:1000 @ A2
DA ref: 121_DA_04.1

NEW masterplanning
Second Floor 107 Bournemouth Road
Poole, Dorset BH14 9HR
+44 (0)1202 742228
www.newmasterplanning.com

Appendix B Drainage and Utilities Plan



Notes

1. Service locations are based on utility supply records supplied by Atkins Ready to Dig Survey (May 2017) and should be seen as indicative only, until verified on site.
2. This plan only indicates known utilities located within the site and its local vicinity. Services further afield and any potential unknown services will not have been plotted on this drawing.
3. Based on a proposed development of up to 60 dwellings, Wessex Water have confirmed adequate capacity exists within the local foul network. An agreed point of connection will be established once a detail site layout is available.

Area Summary Schedule

Gross Site Area	1.86 ha
Developable Area	1.435 ha
Impermeable Area (60%)	0.861 ha

Attenuation Summary

Attenuation Type	Basin
Side Slopes	1 in 3
Max Depth	1.3 m
100yr +40% Water Level	1.0 m
100yr +40% CC Volume	500 m^3*

* Assumes a single attenuation feature with no allowances for potential infiltration

Key

- Boundary (Site 2 Flowers Drove + Sunnyside Farm)
- Proposed Development Area

Existing Utilities

- WW Distribution Main
- SSE HV OH Cable
- SSE HV UG Cable
- SSE LV UG Cable
- SSE LV OH Cable
- BT UG Cable
- BT OH Cable
- Virgin Media UG Cable
- SGN Low Pressure Main
- SGN Medium Pressure Main
- SSE Low Pressure Main

Existing Drainage

- WW Foul water sewer
- WW Surface water sewer
- WW Foul Rising Main
- Existing Ditch
- Easement

REV	DATE	DESCRIPTION	BY	CHK	APD
B	23.06.2017	UPDATED DETENTION BASIN	JDLC	CPY	CPY
A	19.06.2017	INITIAL ISSUE	TMR	JDLC	CPY

CLIENT: WYATT HOMES

DRAWING STATUS: FOR INFORMATION ONLY

PROJECT: PURBECK PROMOTIONAL SITES

TITLE: CONSTRAINTS PLAN SITE 2 FLOWERS DROVE AND SUNNYSIDE FARM

PROJECT No:	DRAWING No:	REV:
0657	CNS-102	B

SCALE @ A0: 1:1000 (0 – 50 metres)

awcockward partnership
Awcock Ward Partnership, Kensington Court, Woodwater Park, Pynes Hill, Exeter, EX2 5TY
Tel: 01392 409007 Web: www.awpexeter.com

Appendix C Local Facilities Plan

awcockward partnership

Lytchett Matravers (Site 2)
Accessibility Plan

Job number:	0657
Drawn:	IW
Checked:	AJW
Approved:	IDA

Figure 6.1

Appendix D Frontage Access Plan (Drawing SK-03)

Notes:

Visibility splays to be kept clear of obstructions above 600mm.

REV	DATE	DESCRIPTION	BY	CHK	APD
A	11.07.2017	INITIAL ISSUE	IW	AJH	AJW

CLIENT:

WYATT HOMES

DRAWING STATUS:

FOR INFORMATION ONLY

PROJECT:

LYTHCETT MATRAVERS PROMOTION SITES

TITLE:

PRELIMINARY ACCESS ARRANGEMENT, (SITE 2, SUNNYSIDE FARM)

PROJECT No:	DRAWING No:	REV:
0657	SK-03	A

SCALE @ A0: 1:500 (0 – 25 metres)

awcockward partnership

Awcock Ward Partnership, Kensington Court, Woodwater Park, Pynes Hill, Exeter, EX2 5TY
Tel: 01392 409007 Web: www.awpexeter.com

Appendix E Correspondence with Wessex Water

Toby Ball

From:	Teddy Takyi-Amuah <Teddy.Takyi-Amuah@wessexwater.co.uk>
Sent:	15 May 2017 12:22
To:	Jacob De la Croix
Cc:	Planning Liaison
Subject:	WW RESP : Flowers Drove/Sunnyside Farm - SY99NW/ 11
Attachments:	Guidance notes for building over or near a sewer.pdf; Guidance notes for adoption of new sewers and pumping stations.pdf

FAO Jacob.DelaCroix@awpexeter.com

Thank you for your enquiry regarding the proposed development of 60 dwellings at the above site.

We have completed a preliminary capacity assessment and can provide the following details for your attention. Please refer to the plans below for information

Foul Water disposal

- There are multiple existing 150 mm public foul sewer within the boundary of the proposed site.
- There are multiple existing rising main, which crosses the boundary of the site.

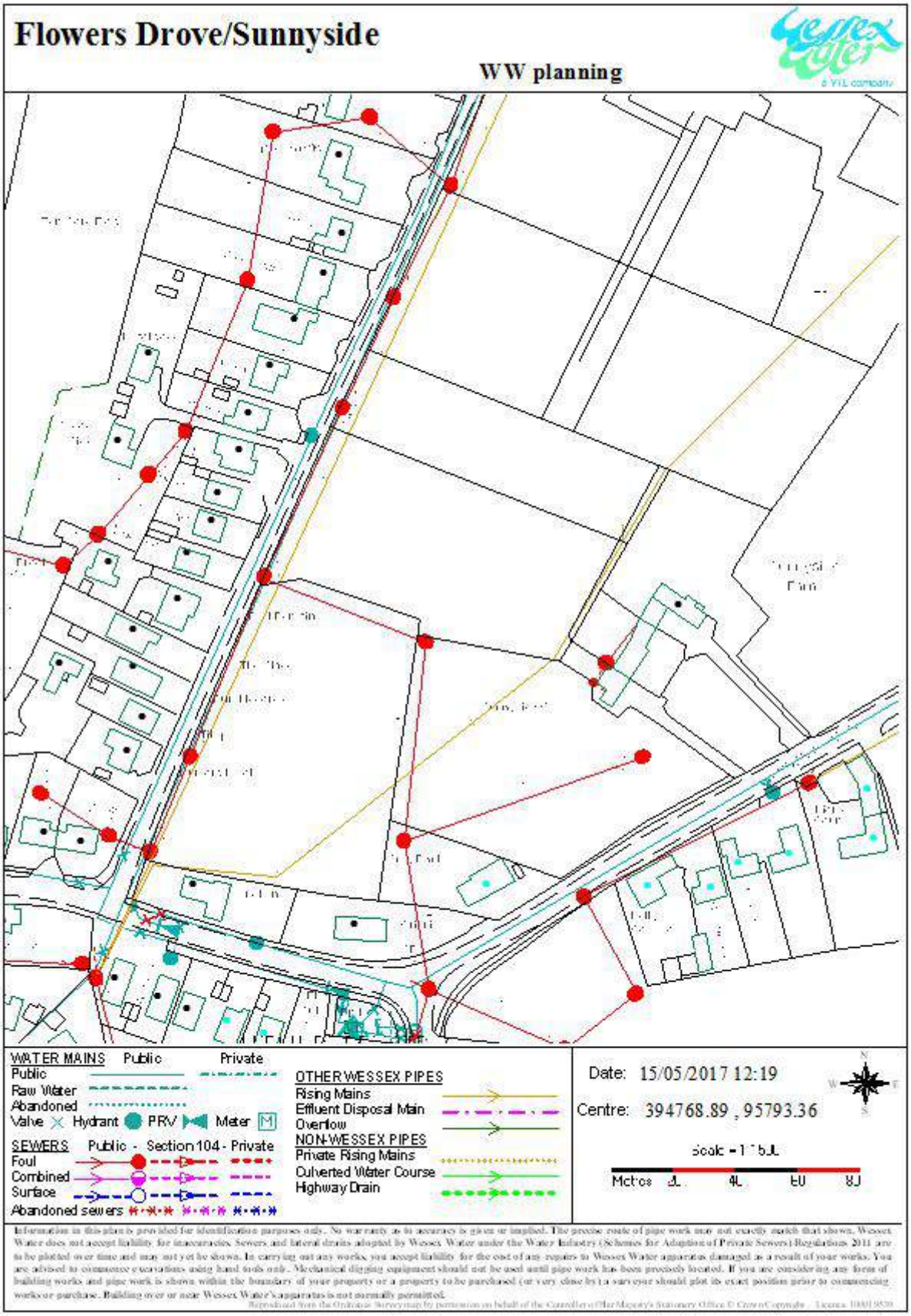
Building over sewers or within easements will not be permitted under Building Regulations. Public sewers must be accurately located on site and it remains our preference to retain current location and easements where possible. Diverting sewers can reduce hydraulic capacity where pipe gradients are affected. (There must be no building within 3 metres of these sewers and no tree planting within 6 metres). We advise that the developer accurately locate these sewers & contacts our regional development team to discuss agreements for diversion proposals and sewer adoptions before detail design layouts are prepared and works are carried out.

- Please note; this is a significant project and will also require further engineering appraisal and cost estimates.

- There is adequate capacity to accommodate the development within the local 150 mm dia public foul sewers.
- A point of connection to be agreed to the afore mentioned sewers subject to detail site layout and the above.

Surface Water disposal

Surface water to be discharged to local land drainage systems with agreed flood risk measures approved by the Lead Local Flood Authority. Surface water connections to the public foul sewer system will not be permitted, as surface water discharges to the public sewer will lead to sewer flooding.



Teddy Amuah
Assistant Engineer
Planning Liaison,

abc

Appendix F Modelling Output

ICP SUDS Mean Annual Flood

Input

Return Period (years) 2 SAAR (mm) 878 Urban 0.000
Area (ha) 1.435 Soil 0.370 Region Number Region 7

Results l/s

QBAR Rural 5.4
QBAR Urban 5.4

Q2 years 4.7

Q1 year 4.6
Q30 years 12.2
Q100 years 17.1

Long Term Storage (LTS) Volume Calculation

Project No.	0657
Project Title	Purbeck promotion sites for Wyatt
Client	Wyatt Homes
	Site 2
Calcs by	MR
Reviewed by	
Date	21.06.2017
Revision	B

awcockward partnership

LTS calculation method based on equation 24.10 from CIRIA C753 - The SuDS Manual (2015);

$$Vol_{xs} = RD \times A \times 10\,[PIMP/100 \times (\alpha \times Cv) + (1\text{-}PIMP/100) \times (\beta \times SPR) - SPR]$$

Where; Vol_{xs} Extra runoff volume from a dev. site compared to the greenfield equivalent during the 100 yr 6 hr storm

RD	Rainfall Depth	70	mm	*(for 100 year 6 hour storm)*
A	*Site Area*	1.435	ha	*(Exc. large undeveloped areas)*
	Impermeable Catchment	0.861	ha	
PIMP	*Percentage Impermeable*	60.0	%	
α	Proportion Impermeable to Network	1.0		
Cv	Impermeable Runoff Coefficient	0.84		*(0.84 Modified Rational Method)*
	Permeable Catchment	0.57	ha	
	Permeable Catchment to Network	0.00	ha	
β	Proportion Perm. to Network	0.00		
SPR	Soil Proportion Runoff	0.37		*(Ref. to WRAP map)*

	RD	*A*		*PIMP*		***α***	*Cv*		*PIMP*		***β***	*SPR*	*SPR*
Vol_{xs} =	70	x 1.44	x 10 x ((	60	/ 100) x (	1.00	x 0.84	) + (1 -	60	/ 100) x (	0.00	x 0.37	) - 0.37)

$Volume_{xs}$ **134.60**

LTS Discharge Rate **2.87** *(2 l/s/ha)*

As above, assuming all permeable surfaces do not enter the drainage system

Vol_{xs} = *134.60*

As above, assuming all permeable surfaces enter the drainage system

Vol_{xs} = *283.27*

Summary of Results for 2 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	98.857	0.157	2.9	0.0	2.9	78.5	O K
30 min Summer	98.908	0.208	2.9	0.0	2.9	104.0	O K
60 min Summer	98.964	0.264	2.9	0.0	2.9	131.9	O K
120 min Summer	99.023	0.323	3.2	0.0	3.2	161.3	O K
180 min Summer	99.056	0.356	3.3	0.0	3.3	178.0	O K
240 min Summer	99.078	0.378	3.4	0.0	3.4	189.0	O K
360 min Summer	99.102	0.402	3.5	0.0	3.5	201.1	O K
480 min Summer	99.114	0.414	3.6	0.0	3.6	207.0	O K
600 min Summer	99.122	0.422	3.6	0.0	3.6	211.0	O K
720 min Summer	99.128	0.428	3.6	0.0	3.6	213.8	O K
960 min Summer	99.134	0.434	3.6	0.0	3.6	216.8	O K
1440 min Summer	99.134	0.434	3.6	0.0	3.6	216.8	O K
2160 min Summer	99.120	0.420	3.6	0.0	3.6	209.8	O K
2880 min Summer	99.101	0.401	3.5	0.0	3.5	200.3	O K
4320 min Summer	99.061	0.361	3.3	0.0	3.3	180.3	O K
5760 min Summer	99.022	0.322	3.2	0.0	3.2	161.1	O K
7200 min Summer	98.986	0.286	3.0	0.0	3.0	143.2	O K
8640 min Summer	98.954	0.254	2.9	0.0	2.9	126.8	O K
10080 min Summer	98.921	0.221	2.9	0.0	2.9	110.3	O K
15 min Winter	98.876	0.176	2.9	0.0	2.9	88.0	O K
30 min Winter	98.934	0.234	2.9	0.0	2.9	116.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	49.739	0.0	74.3	0.0	19
30 min Summer	33.267	0.0	100.6	0.0	33
60 min Summer	21.493	0.0	135.5	0.0	64
120 min Summer	13.626	0.0	172.4	0.0	122
180 min Summer	10.390	0.0	197.4	0.0	182
240 min Summer	8.562	0.0	217.0	0.0	242
360 min Summer	6.487	0.0	246.8	0.0	360
480 min Summer	5.322	0.0	270.0	0.0	430
600 min Summer	4.565	0.0	289.4	0.0	492
720 min Summer	4.026	0.0	306.2	0.0	556
960 min Summer	3.303	0.0	334.3	0.0	686
1440 min Summer	2.499	0.0	377.1	0.0	966
2160 min Summer	1.888	0.0	436.5	0.0	1384
2880 min Summer	1.549	0.0	477.1	0.0	1788
4320 min Summer	1.171	0.0	540.1	0.0	2596
5760 min Summer	0.961	0.0	594.6	0.0	3400
7200 min Summer	0.823	0.0	636.1	0.0	4176
8640 min Summer	0.725	0.0	671.8	0.0	4928
10080 min Summer	0.651	0.0	702.6	0.0	5656
15 min Winter	49.739	0.0	83.7	0.0	19
30 min Winter	33.267	0.0	112.9	0.0	33

Summary of Results for 2 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Outflow (l/s)	Max Volume (m³)	Status
60 min Winter	98.996	0.296	3.1	0.0	3.1	148.2	O K
120 min Winter	99.063	0.363	3.4	0.0	3.4	181.5	O K
180 min Winter	99.102	0.402	3.5	0.0	3.5	201.0	O K
240 min Winter	99.128	0.428	3.6	0.0	3.6	214.1	O K
360 min Winter	99.158	0.458	3.7	0.0	3.7	229.2	O K
480 min Winter	99.174	0.474	3.8	0.0	3.8	237.0	O K
600 min Winter	99.181	0.481	3.8	0.0	3.8	240.7	O K
720 min Winter	99.186	0.486	3.8	0.0	3.8	243.1	O K
960 min Winter	99.192	0.492	3.9	0.0	3.9	245.8	O K
1440 min Winter	99.186	0.486	3.8	0.0	3.8	242.9	O K
2160 min Winter	99.159	0.459	3.7	0.0	3.7	229.4	O K
2880 min Winter	99.126	0.426	3.6	0.0	3.6	213.1	O K
4320 min Winter	99.062	0.362	3.3	0.0	3.3	181.0	O K
5760 min Winter	99.004	0.304	3.1	0.0	3.1	151.9	O K
7200 min Winter	98.949	0.249	2.9	0.0	2.9	124.6	O K
8640 min Winter	98.883	0.183	2.9	0.0	2.9	91.5	O K
10080 min Winter	98.834	0.134	2.9	0.0	2.9	66.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
60 min Winter	21.493	0.0	152.0	0.0	62
120 min Winter	13.626	0.0	193.3	0.0	120
180 min Winter	10.390	0.0	221.3	0.0	178
240 min Winter	8.562	0.0	243.3	0.0	236
360 min Winter	6.487	0.0	276.6	0.0	348
480 min Winter	5.322	0.0	302.6	0.0	456
600 min Winter	4.565	0.0	324.2	0.0	556
720 min Winter	4.026	0.0	342.9	0.0	580
960 min Winter	3.303	0.0	374.3	0.0	732
1440 min Winter	2.499	0.0	421.3	0.0	1040
2160 min Winter	1.888	0.0	489.1	0.0	1492
2880 min Winter	1.549	0.0	534.5	0.0	1932
4320 min Winter	1.171	0.0	605.1	0.0	2768
5760 min Winter	0.961	0.0	666.1	0.0	3576
7200 min Winter	0.823	0.0	712.6	0.0	4400
8640 min Winter	0.725	0.0	752.8	0.0	5104
10080 min Winter	0.651	0.0	787.6	0.0	5648

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.000	Shortest Storm (mins)	15
Ratio R	0.326	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.861

Time (mins) From:	To:	Area (ha)
0	4	0.861

Model Details

Storage is Online Cover Level (m) 100.000

Tank or Pond Structure

Invert Level (m) 98.700

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	500.0	1.300	500.0

Hydro-Brake Optimum® Outflow Control

Unit Reference	MD-SHE-0091-2900-0264-2900
Design Head (m)	0.264
Design Flow (l/s)	2.9
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	91
Invert Level (m)	98.700
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.264	2.9
Flush-Flo™	0.129	2.9
Kick-Flo®	0.216	2.6
Mean Flow over Head Range	-	2.2

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	1.200	5.8	3.000	9.0	7.000	13.8
0.200	2.7	1.400	6.3	3.500	9.7	7.500	14.2
0.300	3.1	1.600	6.7	4.000	10.4	8.000	14.7
0.400	3.5	1.800	7.1	4.500	11.0	8.500	15.2
0.500	3.9	2.000	7.4	5.000	11.6	9.000	15.6
0.600	4.2	2.200	7.8	5.500	12.2	9.500	16.0
0.800	4.8	2.400	8.1	6.000	12.7		
1.000	5.4	2.600	8.4	6.500	13.3		

Orifice Overflow Control

Diameter (m) 0.084 Discharge Coefficient 0.600 Invert Level (m) 99.192

Kensington Court
Woodwater Park Pynes Hill
Exeter EX2 5TY

Attenuation Req (Site 1)
30 year + 40%

Date 04/07/2017 13:47
File 0657-SW-02-B (SITE 2 - ...

Designed by Toby.Ball
Checked by

XP Solutions | Source Control 2016.1

Summary of Results for 30 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	99.000	0.300	3.1	0.0	3.1	149.8	O K
30 min Summer	99.100	0.400	3.5	0.0	3.5	200.2	O K
60 min Summer	99.209	0.509	3.9	0.1	4.0	254.7	O K
120 min Summer	99.308	0.608	4.3	3.9	8.2	303.9	O K
180 min Summer	99.347	0.647	4.4	4.9	9.3	323.4	O K
240 min Summer	99.364	0.664	4.4	5.3	9.7	332.0	O K
360 min Summer	99.386	0.686	4.5	5.7	10.2	343.2	O K
480 min Summer	99.400	0.700	4.5	6.0	10.5	350.2	O K
600 min Summer	99.408	0.708	4.6	6.1	10.7	354.1	O K
720 min Summer	99.412	0.712	4.6	6.2	10.8	355.8	O K
960 min Summer	99.411	0.711	4.6	6.2	10.8	355.3	O K
1440 min Summer	99.394	0.694	4.5	5.9	10.4	346.8	O K
2160 min Summer	99.361	0.661	4.4	5.2	9.7	330.3	O K
2880 min Summer	99.332	0.632	4.3	4.6	8.9	315.7	O K
4320 min Summer	99.292	0.592	4.2	3.2	7.4	296.2	O K
5760 min Summer	99.264	0.564	4.1	1.9	6.0	282.2	O K
7200 min Summer	99.240	0.540	4.0	1.0	5.0	269.7	O K
8640 min Summer	99.211	0.511	3.9	0.2	4.1	255.7	O K
10080 min Summer	99.170	0.470	3.8	0.0	3.8	234.9	O K
15 min Winter	99.036	0.336	3.2	0.0	3.2	167.8	O K
30 min Winter	99.149	0.449	3.7	0.0	3.7	224.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	94.084	0.0	143.1	0.0	19
30 min Summer	63.369	0.0	192.1	0.0	34
60 min Summer	40.933	0.0	259.9	0.1	64
120 min Summer	25.664	0.0	326.5	20.8	122
180 min Summer	19.299	0.0	368.6	42.1	180
240 min Summer	15.677	0.0	399.4	57.7	230
360 min Summer	11.688	0.0	446.8	81.0	282
480 min Summer	9.480	0.0	483.1	97.7	344
600 min Summer	8.053	0.0	512.7	110.1	410
720 min Summer	7.044	0.0	537.9	119.5	478
960 min Summer	5.700	0.0	579.2	130.7	616
1440 min Summer	4.223	0.0	636.6	133.4	882
2160 min Summer	3.123	0.0	723.3	122.7	1280
2880 min Summer	2.519	0.0	777.4	109.2	1672
4320 min Summer	1.858	0.0	857.4	78.7	2464
5760 min Summer	1.497	0.0	926.5	48.8	3280
7200 min Summer	1.266	0.0	979.5	22.5	4104
8640 min Summer	1.105	0.0	1024.7	2.9	5008
10080 min Summer	0.984	0.0	1063.4	0.0	5752
15 min Winter	94.084	0.0	160.3	0.0	19
30 min Winter	63.369	0.0	214.2	0.0	33

Summary of Results for 30 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
60 min Winter	99.270	0.570	4.1	2.1	6.3	284.8	O K
120 min Winter	99.376	0.676	4.5	5.5	10.0	337.8	O K
180 min Winter	99.424	0.724	4.6	6.4	11.0	361.9	O K
240 min Winter	99.446	0.746	4.7	6.8	11.5	373.2	O K
360 min Winter	99.469	0.769	4.7	7.1	11.9	384.5	O K
480 min Winter	99.482	0.782	4.8	7.3	12.1	391.2	O K
600 min Winter	99.486	0.786	4.8	7.4	12.2	393.2	O K
720 min Winter	99.485	0.785	4.8	7.4	12.2	392.5	O K
960 min Winter	99.473	0.773	4.8	7.2	12.0	386.7	O K
1440 min Winter	99.438	0.738	4.7	6.6	11.3	368.8	O K
2160 min Winter	99.384	0.684	4.5	5.7	10.2	342.0	O K
2880 min Winter	99.342	0.642	4.4	4.8	9.2	321.0	O K
4320 min Winter	99.292	0.592	4.2	3.2	7.4	296.1	O K
5760 min Winter	99.261	0.561	4.1	1.7	5.8	280.4	O K
7200 min Winter	99.232	0.532	4.0	0.7	4.7	266.0	O K
8640 min Winter	99.185	0.485	3.8	0.0	3.8	242.4	O K
10080 min Winter	99.125	0.425	3.6	0.0	3.6	212.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
60 min Winter	40.933	0.0	291.4	7.1	62
120 min Winter	25.664	0.0	366.1	43.8	120
180 min Winter	19.299	0.0	413.2	69.3	176
240 min Winter	15.677	0.0	447.7	87.8	228
360 min Winter	11.688	0.0	500.8	115.5	286
480 min Winter	9.480	0.0	541.5	135.5	362
600 min Winter	8.053	0.0	574.7	150.7	436
720 min Winter	7.044	0.0	603.0	162.6	512
960 min Winter	5.700	0.0	649.2	179.3	656
1440 min Winter	4.223	0.0	713.8	190.5	938
2160 min Winter	3.123	0.0	810.3	177.3	1340
2880 min Winter	2.519	0.0	870.9	157.2	1732
4320 min Winter	1.858	0.0	960.2	108.6	2512
5760 min Winter	1.497	0.0	1037.7	60.4	3400
7200 min Winter	1.266	0.0	1097.2	19.3	4320
8640 min Winter	1.105	0.0	1148.0	0.0	5272
10080 min Winter	0.984	0.0	1191.8	0.0	6056

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.000	Shortest Storm (mins)	15
Ratio R	0.326	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.861

Time (mins) From:	To:	Area (ha)
0	4	0.861

Model Details

Storage is Online Cover Level (m) 100.000

Tank or Pond Structure

Invert Level (m) 98.700

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	500.0	1.300	500.0

Hydro-Brake Optimum® Outflow Control

Unit Reference	MD-SHE-0091-2900-0264-2900
Design Head (m)	0.264
Design Flow (l/s)	2.9
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	91
Invert Level (m)	98.700
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.264	2.9
Flush-Flo™	0.129	2.9
Kick-Flo®	0.216	2.6
Mean Flow over Head Range	-	2.2

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	1.200	5.8	3.000	9.0	7.000	13.8
0.200	2.7	1.400	6.3	3.500	9.7	7.500	14.2
0.300	3.1	1.600	6.7	4.000	10.4	8.000	14.7
0.400	3.5	1.800	7.1	4.500	11.0	8.500	15.2
0.500	3.9	2.000	7.4	5.000	11.6	9.000	15.6
0.600	4.2	2.200	7.8	5.500	12.2	9.500	16.0
0.800	4.8	2.400	8.1	6.000	12.7		
1.000	5.4	2.600	8.4	6.500	13.3		

Orifice Overflow Control

Diameter (m) 0.084 Discharge Coefficient 0.600 Invert Level (m) 99.192

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	99.088	0.388	3.5	0.0	3.5	193.8	O K
30 min Summer	99.224	0.524	4.0	0.4	4.4	261.9	O K
60 min Summer	99.360	0.660	4.4	5.2	9.7	330.2	O K
120 min Summer	99.482	0.782	4.8	7.3	12.1	391.2	O K
180 min Summer	99.532	0.832	4.9	8.0	13.0	416.2	O K
240 min Summer	99.552	0.852	5.0	8.3	13.3	425.9	O K
360 min Summer	99.578	0.878	5.0	8.6	13.7	438.9	O K
480 min Summer	99.592	0.892	5.1	8.8	13.9	446.2	O K
600 min Summer	99.599	0.899	5.1	8.9	14.0	449.4	O K
720 min Summer	99.600	0.900	5.1	8.9	14.0	449.9	O K
960 min Summer	99.592	0.892	5.1	8.8	13.9	446.1	O K
1440 min Summer	99.559	0.859	5.0	8.4	13.4	429.6	O K
2160 min Summer	99.502	0.802	4.8	7.6	12.5	400.8	O K
2880 min Summer	99.450	0.750	4.7	6.8	11.5	375.2	O K
4320 min Summer	99.376	0.676	4.5	5.5	10.0	337.8	O K
5760 min Summer	99.327	0.627	4.3	4.5	8.8	313.5	O K
7200 min Summer	99.298	0.598	4.2	3.5	7.7	299.1	O K
8640 min Summer	99.277	0.577	4.2	2.5	6.6	288.4	O K
10080 min Summer	99.258	0.558	4.1	1.6	5.7	278.9	O K
15 min Winter	99.134	0.434	3.6	0.0	3.6	217.2	O K
30 min Winter	99.286	0.586	4.2	2.9	7.1	292.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	121.571	0.0	184.6	0.0	19
30 min Summer	82.724	0.0	246.3	0.7	34
60 min Summer	53.779	0.0	342.4	33.4	62
120 min Summer	33.735	0.0	430.2	83.7	122
180 min Summer	25.270	0.0	483.7	114.9	180
240 min Summer	20.419	0.0	521.3	136.4	222
360 min Summer	15.120	0.0	579.0	168.4	278
480 min Summer	12.201	0.0	622.9	191.4	342
600 min Summer	10.321	0.0	658.3	208.9	410
720 min Summer	8.997	0.0	688.2	222.5	478
960 min Summer	7.237	0.0	736.5	241.8	616
1440 min Summer	5.313	0.0	802.3	257.2	882
2160 min Summer	3.891	0.0	901.6	244.9	1276
2880 min Summer	3.115	0.0	961.8	227.2	1668
4320 min Summer	2.272	0.0	1048.7	191.1	2420
5760 min Summer	1.814	0.0	1123.3	154.5	3168
7200 min Summer	1.526	0.0	1180.5	119.3	3896
8640 min Summer	1.324	0.0	1229.1	86.1	4672
10080 min Summer	1.175	0.0	1270.5	56.1	5544
15 min Winter	121.571	0.0	206.0	0.0	19
30 min Winter	82.724	0.0	272.9	9.9	33

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
60 min Winter	99.439	0.739	4.7	6.7	11.3	369.4	O K
120 min Winter	99.579	0.879	5.0	8.7	13.7	439.7	O K
180 min Winter	99.640	0.940	5.2	9.4	14.6	469.8	O K
240 min Winter	99.665	0.965	5.3	9.7	14.9	482.3	O K
360 min Winter	99.687	0.987	5.3	9.9	15.2	493.6	O K
480 min Winter	99.699	0.999	5.4	10.0	15.4	499.4	O K
600 min Winter	99.699	0.999	5.4	10.0	15.4	499.6	O K
720 min Winter	99.693	0.993	5.3	10.0	15.3	496.4	O K
960 min Winter	99.669	0.969	5.3	9.7	15.0	484.6	O K
1440 min Winter	99.608	0.908	5.1	9.0	14.1	454.2	O K
2160 min Winter	99.521	0.821	4.9	7.9	12.8	410.5	O K
2880 min Winter	99.451	0.751	4.7	6.9	11.6	375.6	O K
4320 min Winter	99.359	0.659	4.4	5.2	9.6	329.3	O K
5760 min Winter	99.308	0.608	4.3	3.9	8.2	304.0	O K
7200 min Winter	99.282	0.582	4.2	2.7	6.9	290.8	O K
8640 min Winter	99.260	0.560	4.1	1.7	5.8	280.0	O K
10080 min Winter	99.239	0.539	4.0	1.0	5.0	269.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
60 min Winter	53.779	0.0	383.8	57.8	62
120 min Winter	33.735	0.0	482.3	116.9	118
180 min Winter	25.270	0.0	542.2	153.1	176
240 min Winter	20.419	0.0	584.3	178.1	228
360 min Winter	15.120	0.0	649.0	215.5	286
480 min Winter	12.201	0.0	698.0	242.5	362
600 min Winter	10.321	0.0	737.7	263.2	438
720 min Winter	8.997	0.0	771.1	279.6	514
960 min Winter	7.237	0.0	825.2	303.7	658
1440 min Winter	5.313	0.0	898.5	329.4	938
2160 min Winter	3.891	0.0	1010.1	324.8	1340
2880 min Winter	3.115	0.0	1077.5	300.2	1728
4320 min Winter	2.272	0.0	1174.5	246.6	2464
5760 min Winter	1.814	0.0	1258.2	187.9	3176
7200 min Winter	1.526	0.0	1322.4	132.2	4032
8640 min Winter	1.324	0.0	1376.9	81.9	4848
10080 min Winter	1.175	0.0	1423.8	38.6	5752

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.000	Shortest Storm (mins)	15
Ratio R	0.326	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.861

Time (mins) From:	To:	Area (ha)
0	4	0.861

Model Details

Storage is Online Cover Level (m) 100.000

Tank or Pond Structure

Invert Level (m) 98.700

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	500.0	1.300	500.0

Hydro-Brake Optimum® Outflow Control

Unit Reference	MD-SHE-0091-2900-0264-2900
Design Head (m)	0.264
Design Flow (l/s)	2.9
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	91
Invert Level (m)	98.700
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.264	2.9
Flush-Flo™	0.129	2.9
Kick-Flo®	0.216	2.6
Mean Flow over Head Range	-	2.2

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	1.200	5.8	3.000	9.0	7.000	13.8
0.200	2.7	1.400	6.3	3.500	9.7	7.500	14.2
0.300	3.1	1.600	6.7	4.000	10.4	8.000	14.7
0.400	3.5	1.800	7.1	4.500	11.0	8.500	15.2
0.500	3.9	2.000	7.4	5.000	11.6	9.000	15.6
0.600	4.2	2.200	7.8	5.500	12.2	9.500	16.0
0.800	4.8	2.400	8.1	6.000	12.7		
1.000	5.4	2.600	8.4	6.500	13.3		

Orifice Overflow Control

Diameter (m) 0.084 Discharge Coefficient 0.600 Invert Level (m) 99.192

Appendix G Utility Supply Sheet

Utility Supply/Diversion Summary Sheet

Job Number:	0657
Revision - Date:	B - 17/07/17

Purbeck Promotion Sites for Wyatt

Utility	Company	Quote	Reinforcement	Provider Contact Details	Summary/Comments	Lead in time
Gas	Scotia Gas Networks (SGN)	£39,000 (exc. VAT) details	Reinforcement: None specified Supply: N/A Diversion: None required	Will Tambrescu will.tambrescu@sgn.co.uk Tel: 01293 818380 Ref: 1411489	SGN to connect the site from the existing Low Pressure main in Flowers Drove and install appropriately sized gas infrastructure to suitable locations for 60 domestic properties. SGN will carried out excavation and reinstatement of trenches within the public highway to the site boundary, however it would be the customer's responsibility so carry out the excavation and reinstatement of trenches on private land. No meter / housing or meter work is included.	Not Specified
Electricity	Scottish & Southern Electricity (SSE)	£85,000 (exc. VAT) details	Reinforcement: None specified Supply: N/A Diversion: None required	Graham Bendall graham.bendall@sse.com Ref: EJR782-EJR799-EJR814	It is estimated that each potential development site will require the installation of a 11 kV feeder from the network. It is also estimated that one sub-station per site will be required. The preliminary estimates have been based on the assumption that homes will not be electrically heated and no diversion/reinforcement will be required at the sites (however correspondence from SSE suggests that diversion is likely).	Not Specified
Water	Wessex Water (WW)	£X (inc. VAT) details	Reinforcement: None specified Supply: N/A Diversion: None required	EXAMPLE: Angie Brown DeveloperServicesPlanning@southwestwater.co.uk 01392 443661 Ref: WR 2749372		X weeks
Telecoms	Openreach	£0 (inc. VAT) details	Reinforcement: None specified Supply: N/A Diversion: None required	Aaron Leverett aaron.leverett@openreach.co.uk Ref: Form 9964-7221	Openreach will deploy FTTP, free of charge, into all new housing developments of 30 houses of more. Fibre-optic cabling within the development will also be provided free of charge. This does not appear to include diversion of their network (if required).	Not Specified
	Virgin Media	£X (inc. VAT) details	Reinforcement: None specified Supply: N/A Diversion: None required	EXAMPLE: Morag Dawson Morag.Dawson@virginmedia.co.uk Tel: 01392 200632 Mob: 07985 807672 Ref: VM/CIP/253444		X weeks