



STATUE HOMES

**KYNGS GOLF COURSE,
MARKET BOSWORTH,
COVENTRY
CV13 0NP**

DRAINAGE STRATEGY

MARCH 2020

FW1219/DS/001-v4

SYNOPSIS

Farrow Walsh have been commissioned by the Client, to prepare the Drainage Strategy in support of the proposed residential development at Kyngs Golf Course, Market Bosworth, Coventry.

REVISION HISTORY

Revision	Status	Author	Checker	Approved	Date
v1	First Issue	BM	CB	JD	06.09.2018
v2	Second Issue.	BM	CB	JD	11.10.2018
v3	Third Issue.	BM	CB	JD	04.02.2020
v4	Appendix B – Proposed Drainage Strategy updated to suit LLFA comments dated 13.02.2020.	BM	OP	JD	23.03.2020

SYNOPSIS

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1.0 BRIEF

- 1.01 Farrow Walsh have been commissioned by the applicant, to undertake the Drainage Strategy in support of the planning application for the proposed residential development at Kyngs Golf Course, Market Bosworth, Coventry. The purpose of this document is to report on the Conceptual Drainage Strategy for the proposed development and provide recommendations as to the use of SuDS within the development.

2.0 DOCUMENTS EXAMINED

- 2.01 A plan of the development proposals prepared by Hickman & Smith Architects, the Architect, is located within Appendix A.

3.0 INTRODUCTION

- 3.01 The proposal includes a redevelopment of an existing Golf Course, which includes the new Clubhouse and 6 lodges to support the golfing holiday destination.
- 3.02 The site location is bound to the North by Agricultural Land and to the East by a single residential dwelling. The West of the site is bound by a private road. The site is bound to the South by Station Road.
- 3.03 The site has a development area of 26,317m² (2.632ha), which comprises of greenfield classified land.
- 3.04 This report has been prepared using the following guidance documentation:
- National Planning Policy Guidance (NPPG)
 - Ciria C753 – The SUDs Manual
 - Adapting to Climate Change: Advice for Flood and Coastal Erosion Risk Management Authorities (EA - February 2016)

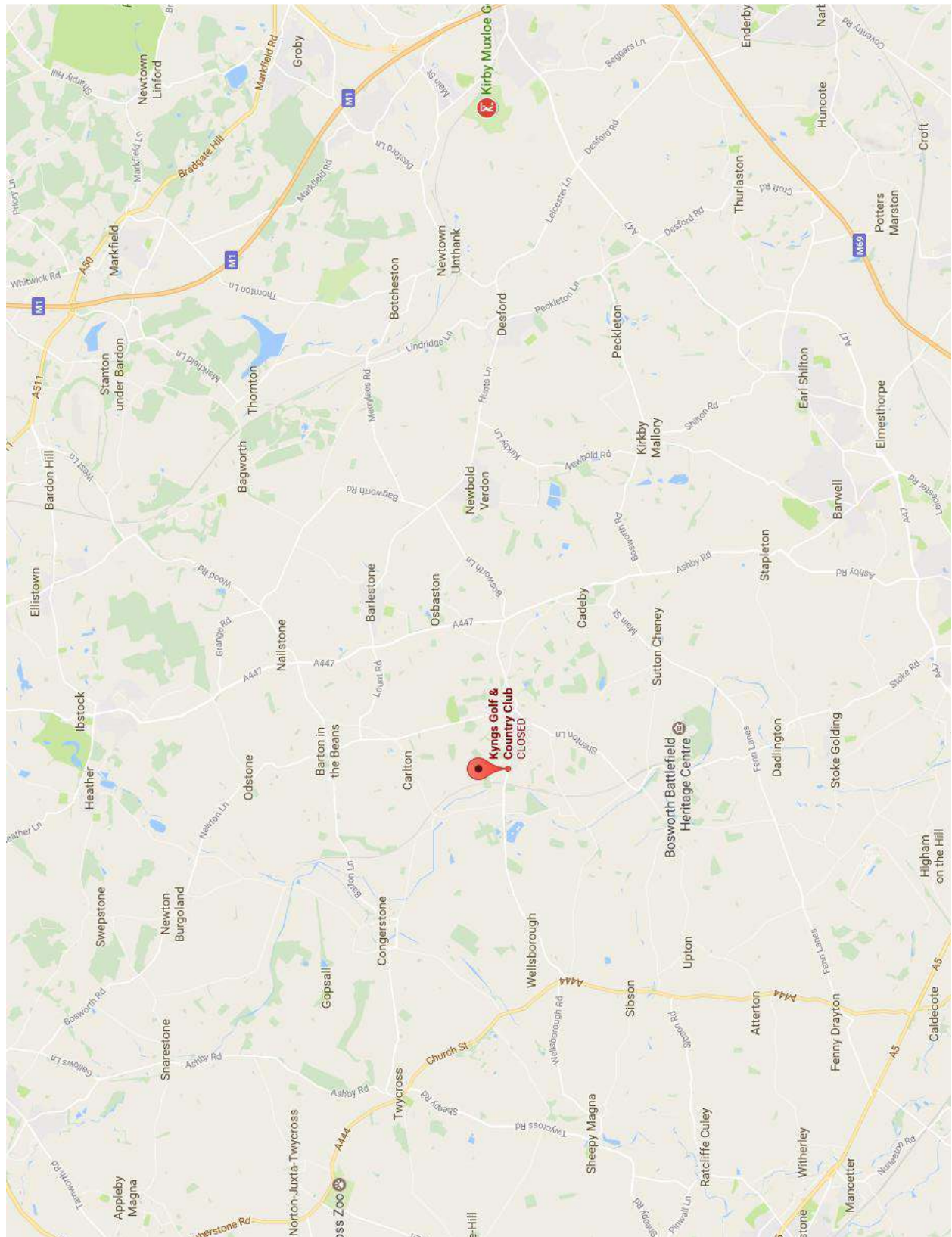


Figure 1 -Site Location Plan



Figure 2 – Detailed Site Location Plan

4.0 DRAINAGE STRATEGY

4.01 EXISTING SEWERAGE SYSTEMS

- 4.01.1 Severn Trent Water sewer records have been requested and can be found within Appendix C of this report. The sewer records indicate that the development contains a Ø300mm vitrified clay combined water sewer.
- 4.01.2 The proposed development area is not anticipated to contain surface or foul water drains. Further investigation, via a CCTV survey, is required to confirm the location and condition of any drains present on the site. Where possible the existing outfall connections into the adjacent sewers are to be re-used to minimise any works within the highway.
- 4.01.3 The site comprises largely of greenfield land. The existing surface water is anticipated to run into the ordinary watercourses that surround the site.
- 4.01.4 The greenfield runoff rates for the site area have been calculated using the HR Wallingford Method and can be found within Appendix E.
- $Q_{BAR,GR} = 11.81 \text{ l/s}$
 - $Q_{1,GR} = 9.80 \text{ l/s}$
 - $Q_{30,GR} = 23.62 \text{ l/s}$
 - $Q_{100,GR} = 30.36 \text{ l/s}$

4.01.5 The existing surface water drainage system can be summarised as follows:

- 90% permeable (greenfield)

4.02 PROPOSED SURFACE WATER DRAINAGE STRATEGY

4.02.1 Surface Water runoff from the proposed development should mimic, as far as possible, the surface flows from an undeveloped greenfield site.

4.02.2 Greenfield runoff rates for an undeveloped site have been calculated in accordance with current guidance and calculations can be found within Appendix E and are discussed in section 4.01.5.

4.02.3 Building Regulations 2010 Part H guidance for disposal of surface water is as follows:

- A soakaway or infiltration system, or where not reasonably practical;
- A surface water ditch or watercourse, or where not reasonably practical;
- A below ground sewer

4.02.4 A ground investigation has been undertaken and can be found within Appendix G. When reviewing the borehole logs, much of the site is underlain by Firm clay, which has been topped with either topsoil or made ground consisting of cobbles, gravel and sand. Ground water was not encountered in any of the trial pits despite the ground investigation clearly denoting that there are large amounts of underlying clay. The ground investigation considers infiltration to be unsuitable on site.

4.02.5 The nearest watercourse to the site is Ashby de la Zouch Canal, which is 0.3 miles to the West of the site. A connection to this watercourse is deemed unsuitable due to the distance and existing railway line that is located between the site and the watercourse.

4.02.6 The ground levels on the site fall from South to West at the site entry and from South to North from the rear of the newly located Clubhouse.

4.02.7 Based on the above points surface water disposal by means of treatment and detention prior to controlled release into a surface water ditch and existing watercourse is deemed the most appropriate solution. Details of this can be found within Appendix B.

- 4.02.8 The development area is 3.78ha and it is proposed that 1.05ha of the development will be impermeable and require collecting and attenuating prior to discharge.
- 4.02.9 National Planning Policy Guidance requires that climate change incorporated within the surface water drainage design in accordance with The Environment Agency's 'Adapting to Climate Change: Advice for Flood and Coastal Erosion Risk Management Authorities' February 2016 when assessing flood risk for a development.
- 4.02.10 The design life of the development is beyond 2070, therefore in accordance with the Environment Agency guidance the development should make allowances for an increase in extreme rainfall intensity of an additional 40% when compared to the 1961-1990 baseline.
- 4.02.11 Surface water drainage will be provided by utilising several SuDS features across the site.
- 4.02.12 Surface water drainage will be provided in a new below ground gravity drains constructed around the proposed developments mirroring the existing runoff arrangement with surplus flows being attenuated using both voided stone below the car parking area and attenuation ponds. The proposed surface water runoff rate for the impermeable development area of 0.721 hectares is:
- $Q_{100+40\%cc} = 5.0$ l/s to ordinary watercourse (up to a 6-hour storm event)
- This rate is subject to confirmation by the LLFA.
- 4.02.13 It is currently proposed that the drains within the site will remain under private ownership.
- 4.02.14 With reference to CIRIA 753 and the surface water treatment process, runoff from external hardstand areas will drain via permeable paving with voided stone, conveyance swales and attenuation ponds, which will aid in the removal of sediment, hydrocarbons and heavy metals prior to discharge into the River Welland at a controlled rate. Water butts are to be provided to the rear of the lodges for non-potable use and to provide a low-level reduction in peak runoff.
- 4.02.15 Green roof systems were considered but deemed impracticable due to the pitched nature of the proposed roofs. Due to the nature and size of the site, there is limited opportunity to provide above ground storage and treatment. As discussed in section 4.02.4, infiltration is not deemed suitable on the site.

- 4.02.16 The drawings & schedules of the as-built site drainage system are to be made available to the building occupier to enable drainage maintenance and future works to be undertaken.
- 4.02.17 All sewers and drainage are to be constructed in accordance with all relevant industry standards, including but not limited to:
- Building Regulations Approved Document Part H 2010
 - Sewers For Adoption 6th Edition
- 4.02.18 Further investigation is required by means of a CCTV to establish the size, invert levels and condition for all drainage within the site and connecting into the adjacent public sewers.
- 4.02.19 By controlling the discharge rate from the site for a 1in100 year + 40% storm event to 5.0/s the site is offering a betterment to the downstream network by utilising on site flood storage at an earlier stage before connecting to the downstream networks.
- 4.02.20 The table below demonstrates the surface water discharge reduction when compared to the existing site discharge rates as discussed in section 4.01.4

Table 1 Peak Discharge Comparison

Storm Event	Existing (l/s)	Proposed Peak (l/s)	Reduction
Q ₁	9.80	5.00	49.0%
Q ₃₀	23.62	5.00	78.5%
Q ₁₀₀	30.36	5.00	85.5%
Q ₁₀₀ + 40CC	-	5.00	> 85.5%

- 4.02.21 The discharge proposal offers a 85.5% reduction in surface water runoff for a 1in 100 year storm event, and a 78.5% reduction for a 1 in 30 year storm event.

4.03 ATTENUATION PROPOSALS

- 4.03.1 In accordance with current Environmental Agency Guidance, the attenuation volume for a site should be calculated based on a 1 in 100 year + climate change allowance.
- 4.03.2 It is proposed that the Clubhouse, units and car parking areas are to discharge through the proposed below ground drains, via voided stone attenuation, within the car park and then subsequently into the attenuation ponds.
- 4.03.3 To achieve the reduction in discharge rate, the Clubhouse, car park and Units 1-6 will provide storage by utilising voided stone tanks below permeable paving and an existing attenuation pond to store a minimum of 450m³ of runoff. The discharge for the entire site will be controlled by an orifice flow control chamber, which can be located to the North of the Clubhouse and will discharge into an existing ditch to the West of the site, which can be seen in Fig. 3. All discharge is subject to agreement with the LLFA / EA. The discharge rate has been restricted to 5.0l/s for all storm events up to 1 in 100 year + 40% CC, which is the minimum rate for any development utilising flow controls and storage as defined by current national guidance. At this stage the volumes attenuated within each of these storage structures are indicative and will be modelled in greater detail during the detailed design.



Figure 3 - Existing Ditch located to the West of the site

4.03.4 Preliminary calculations have been undertaken to calculate the volumes of storage required for the adopted highway discharging to the surface water system and summarised below.

1 in 1yr	-	82.201m ³
1 in 2yr	-	101.965m ³
1 in 30yr	-	229.361m ³
1 in 100yr	-	321.757m ³
1 in 100yr+cc	-	450.453m ³

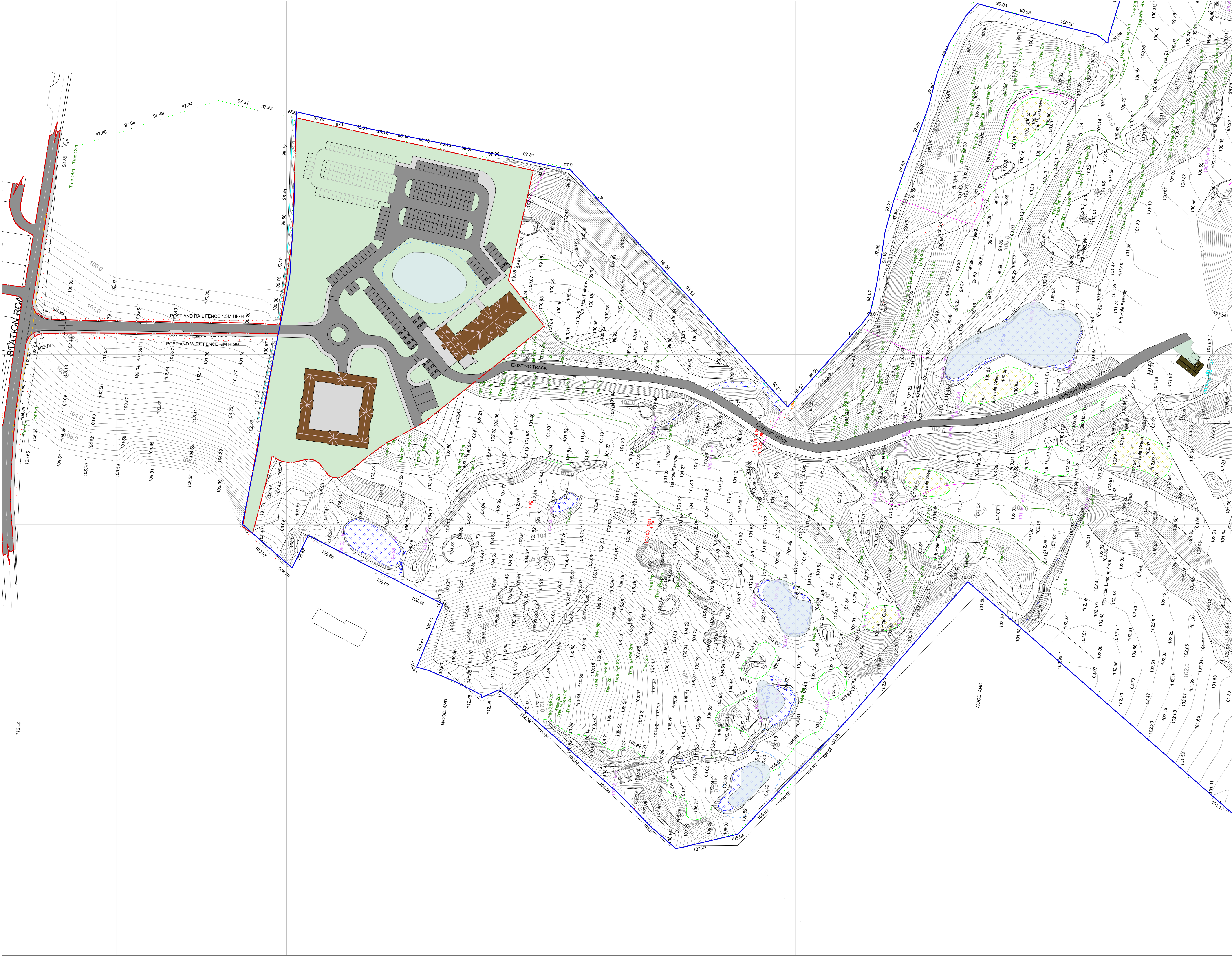
The above values are subject to detailed drainage design.

4.03.5 The proposed surface water drainage system can be summarised as follows:

- The discharge rate has been restricted to 5.0l/s for all storm events, which is the minimum rate for any development utilising flow controls and storage as defined by current national guidance.
- Surface water runoff from the development to discharge at a maximum rate of 5.0l/s into the ordinary watercourse for a 1 in 100 year + 40%CC, 6 hour storm event in accordance with Non-statutory technical standards for sustainable drainage systems.
- The development provides a minimum 49% betterment in comparison to the existing runoff arrangement.
- All storage structures, including attenuation basins, pipework and voided stone will be modelled further during the detailed design stage.

4.03.6 It is proposed that foul drainage will be conveyed from the units by below ground private gravity drains and then treated using a bio disc filtration system prior to connection into the unnamed ordinary watercourse within the site. The final discharge locations are subject to confirmation of the existing outfall locations by means of a CCTV survey. All foul drainage will be vented in accordance Building Regulations Part H.

Appendix A Site Layout



Notes

Measurements not to be scaled from this drawing. All dimensions to be checked and confirmed prior to commencement of work. Contractors to notify architects of site variations affecting information on this drawing. The information in this drawing is copyright of Hickman & Smith Architects Ltd.

Measurements are based on previous drawings provided by the client and as such the site boundary area is to be confirmed by the client.

Date	Rev	By	Details
20.04.18	/	DG	Issued for Client Comments
27.04.18	A	DG	Issued for Client Comments
30.04.18	B	DG	Issued for Client Comments
01.05.18	C	DG	Issued for Client Comments
24.05.18	D	DG	Issued for Client Comments
07.06.18	E	DG	Issued for Client Comments
23.07.18	F	DG	Issued for Client Comments
13.09.18	G	DG	Issued for Client Comments
08.10.18	H	DG	Issued for Client Comments
11.07.19	I	DG	Issued for Client Comments
20.11.19	J	DG	Issued for Client Comments
25.11.19	K	DG	Issued for Client Comments
26.11.19	L	DG	Issued for Client Comments

Location Key

PLANNING

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Project
Market Bosworth Golf Leisure and Country Club

Client
Statue Homes Ltd

Drawing Title
Proposed Site Plan

Date	Scale	Checked
26.11.19	1:1000@A1 1:2000@A3	AS
Project Ref.	Drawing No.	Revision
0196	A-PL-001	L

Appendix B Proposed Drainage Strategy

Site Details

26,317m² / 2.632ha : Development area
7,210m² / 0.721ha : Proposed impermeable area
5.0 l/s : Proposed Q100+40% climate change storm discharge rate to sewer (49% Betterment)

Storage Areas:
Area 1 (Club House & Units 1-6 - Attenuation Pond 1) : 225m³
Area 2 (Permeable Paving with 500mm deep Voided Stone) : 225m³

Development impermeable areas to be drained into the ordinary watercourse via attenuation ponds and voided stone with minimum SUDs treatment to Ciriá753, via gravity and pumped sewers.

All drainage to be constructed in accordance with Sewers for Adoption 6th Edition and Building Regulations Part H.

Layout subject to detailed level and FFL design.

A CCTV survey of the as-built drainage is to be undertaken by the Contractor and provided to the Engineer for final approval

Sewer details shown are taken from STW sewer records and are to be confirmed by Contractor prior to commencement of the works

Minimum pipe cover to soffits to be as per The Building Regulations 2010 Part H for thermoplastic pipes:

- 0.6m in pedestrian or landscaped areas
- 0.9m in vehicle accessible areas

Any pipes with cover to soffit less than those stated above are to have a Class Z concrete pipe bed & surround

Internal foul drain pipe minimum gradients:

- 1:80 from SVP & WC to IC
- 1:40 from Basin & Sink to IC

Refer to Architect's/M&E drawings for pipe sizes and setting-out information.

- 1
- Mesh Screens
- Mesh screen to be placed over the outlet pipe of chamber during site construction works and removed immediately prior to the first occupancy of the dwellings served by the sewers
- 2
- Proposed Outfall
- Proposed storm outfall to ditch subject to LLFA and Environmental Agency approval
- 3
- Existing Attenuation Basin
- Online basin to store surface water runoff on site prior to discharge
- 4
- Discharge Rate
- Storm discharge from site restricted to 5.0l/s. for a 1in100 year +40% climate change storm event, using a flow control chamber. Subject to approval with LLFA.
- 5
- Discharge Conditions
- Drainage discharge rate, water quality criteria and surface water ditch headwall construction subject to the Approval of the Environment Agency prior to commencement of the works.
- 6
- Existing Watercourse Connection
- Connection subject to Ordinary watercourse consent and discharge is subject to LLFA Approval.
- 7
- Hydro-Brake Flow Control Chamber
- Proposed manhole Ø1200 fitted with a Hydro-Brake and 500mm sump (silt trap) to restrict private surface water discharge.
- 8
- Concrete Headwalls
- New precast concrete headwall constructed within the attenuation pond.
- 9
- Proposed Foul Treatment Tank
- Proposed foul treatment tank to manufacturers details.

Storm Event	Proposed Max. Discharge Rate
1 in 1 year	5.0 l/s
1 in 30 year	5.0 l/s
1 in 100+40%CC	5.0 l/s

1

2

3

4

5

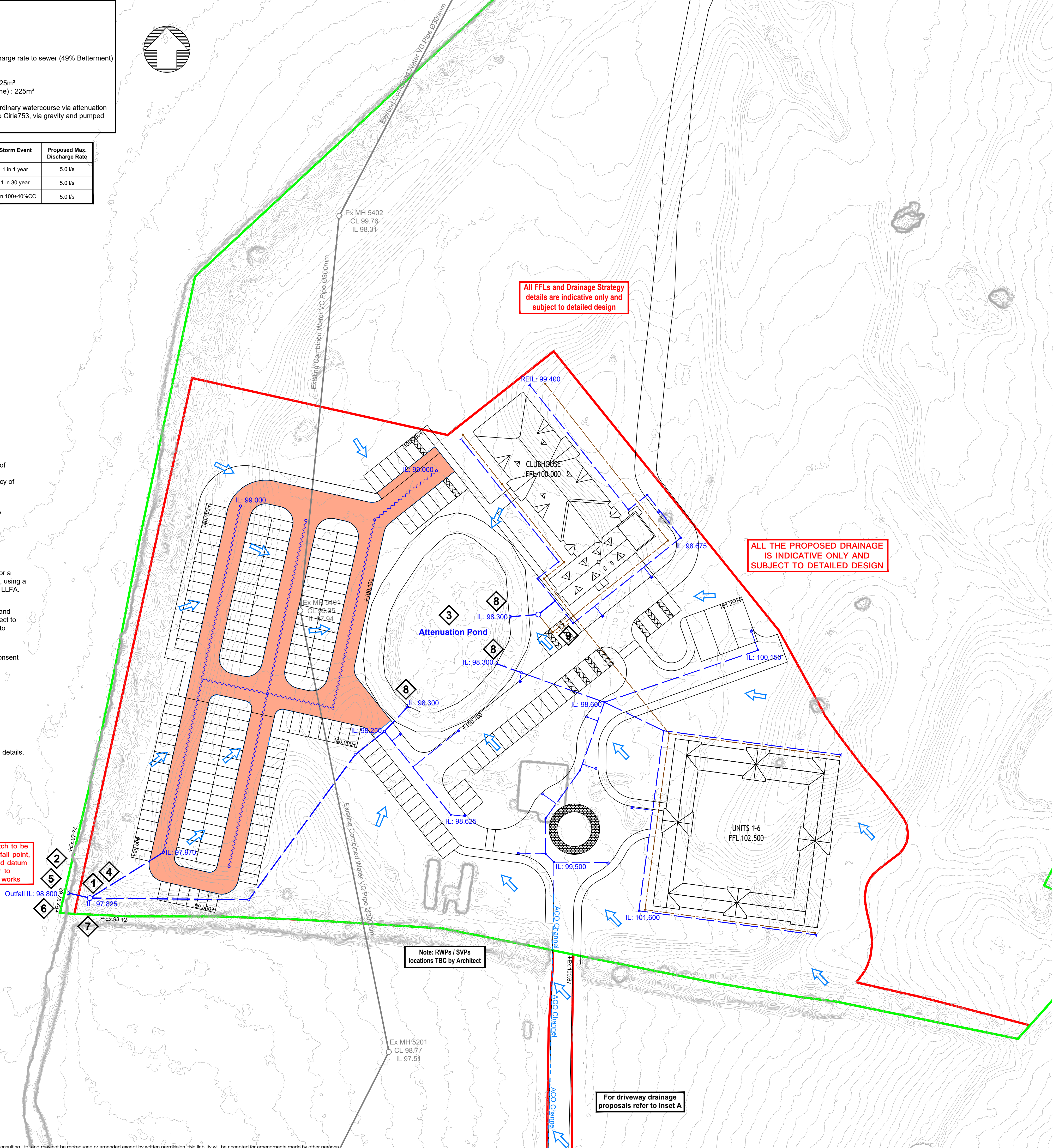
6

7

8

9

Existing surface water ditch to be surveyed at proposed outfall point, using same local grid and datum as site survey, prior to commencement of the works



All FFLs and Drainage Strategy details are indicative only and subject to detailed design

ALL THE PROPOSED DRAINAGE IS INDICATIVE ONLY AND SUBJECT TO DETAILED DESIGN

For driveway drainage proposals refer to Inset A

All drainage to be constructed in accordance with Sewers for Adoption 6th Edition and Building Regulations Part H.

Layout subject to detailed level and FFL design.

A CCTV survey of the as-built drainage is to be undertaken by the Contractor and provided to the Engineer for final approval

Sewer details shown are taken from STW sewer records and are to be confirmed by Contractor prior to commencement of the works

Minimum pipe cover to soffits to be as per The Building Regulations 2010 Part H for thermoplastic pipes:

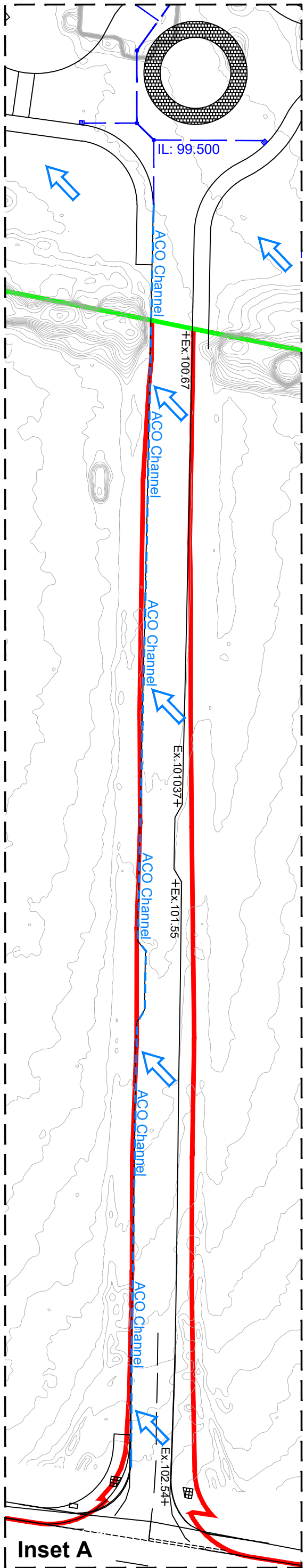
- 0.6m in pedestrian or landscaped areas
- 0.9m in vehicle accessible areas

Any pipes with cover to soffit less than those stated above are to have a Class Z concrete pipe bed & surround

Internal foul drain pipe minimum gradients:

- 1:80 from SVP & WC to IC
- 1:40 from Basin & Sink to IC

Refer to Architect's/M&E drawings for pipe sizes and setting-out information.



- General Notes
1. DO NOT SCALE.

2. This drawing is to be read in conjunction with all other relevant drawings and details.

3. Should there be any conflict between the details indicated on this drawing and those on other drawings the Engineer should be informed PRIOR to construction on site.

4. Until technical approval has been obtained from the relevant Authority, it should be understood that all drawings issued are Preliminary and NOT for construction. Should the Contractor commence site work prior to such approval being given it is entirely at their own risk.

5. Sketch proposals are for illustrative purposes only and as such are subject to detailed site investigation including ground conditions / contaminants, drainage, design and planning / density negotiations.

6. All dimensions are in millimetres unless otherwise stated.

7. The Farrow Walsh Consulting Designers Risk Assessments for this project must be reviewed PRIOR to the commencement of any works on site.

NOTES

1. This drawing is for Planning purposes only and is not to be used for Construction.

2. This drawing to be read in conjunction with all other relevant Engineers and Architect's details.

3. All work is to be carried out in accordance with the current British Standards, codes of practice, building regulations and with Sewers for Adoption 6th Edition guidance.

4. The exact position, level, size and use of existing sewers to be confirmed on site. Any discrepancies to be reported to the Engineer prior to commencement of works.

5. All uncovered and shallow pipework to be protected against construction traffic as part of the Contractors temporary works requirements.

6. All connections to road gullies and channels shall be 150mm nominal bore pipework.

7. All pipework to be U-PVC type in accordance with WIS 4-35-01 unless otherwise noted.

8. All pipes connecting to adopted manholes up to and including 300mm dia. to be Wavin Ultrarib or similar approved.

9. All pipes connecting to adopted manholes greater than 300mm dia. to be Concrete or approved U-PVC.

10. All pipework entering and exiting manholes to be connected with pipe soffits level.

11. All works are to be to the satisfaction of the Engineer, Building Officer, Severn Trent Water, local authority Highway & Flood Planning Officer.

12. All insitu services and drainage networks are to be located and protected as necessary by the Contractor prior to the commencement of the works.

LEGEND

- Site Boundary
-
- Application Boundary

P4	Drainage Strategy updated to suit comments received from LLFA dated 13.03.2020, which include amended outfall, ILs and outline level proposals.	BM	OP	JD	23.03.20
P3	Site layout and respective drainage strategy updated to suit updated application boundary, which no longer includes eastern section.	BM	CB	JD	04.02.20
P2	Site boundary amended to reflect Land Title Plan, SV pump added to eastern region and overland flood arrows added as requested by LLFA 02.10.2018.	BM	CB	JD	11.10.18
P1	Issued for Planning.	BM	CB	JD	06.09.18
Rev	Description of updates	Drawn	Checked	Approved	Date
Revision Schedule					

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FOR PLANNING

Client:
Statue Homes

Project:
Market Bosworth Golf Leisure and Country Retreat, Market Bosworth

Title:
Drainage Strategy

Drawn: BM

Checked: CB

Approved: JD

Date: September 2018

Scale: 1:500 @ A1

Drawing No.
FW1219-D-401

Revision:
P4

Appendix C Severn Trent Water Asset Record Plans

SK3904SE

Sewer Node		Sewer Pipe Data									
REFERENCE	COVER LEVEL	INV LEVEL UPSTR	INV LEVEL DOWNSTR	PURP	MATL	SHAPE	MAX SIZE	MIN SIZE	GRADIENT	YEAR LAID	
SK39036501	100.35	98.79	98.31	C	VC	C	300	nil	253.31	nil	
SK39037501	102.08	100.48	98.79	C	VC	C	300	nil	63.78	nil	
SK39038601	104.32	102.24	100.48	C	GRP	C	300	nil	64.23	nil	
SK39039601	103.95	102.33	102.24	C	VC	C	300	nil	1205.78	nil	

SK3803NNW

SK3903NNW

SK3903SE

- ✕✕✕✕ Abandoned Sewer

Private Combined Gravity Sewer

Private Foul Gravity Sewer

Private Surface Water Gravity Sewer

Public Combined Gravity Sewer

Public Foul Gravity Sewer

Public Surface Water Gravity Sewer

Trunk Combined Gravity Sewer

Trunk Foul Use Gravity Sewer

Trunk Surface Water Gravity Sewer

Combined Use Pressurised Sewer

Foul Use Pressurised Sewer

Surface Water Pressurised Sewer

Highway Drain

Combined Lateral Drain (SS)

Foul Lateral Drain (SS)

Surface Water Lateral Drain (SS)

○—○ Cable, Earthing

> Cable Junction

----- Cable, Optical Fibre/Instrumentation

----- Cable, Low Voltage

----- Cable, High Voltage

+++++ Cable, Other

B

Housing, Building

K

Housing, Kiosk

LC

Disposal Site

STW

Sewage Treatment Works

●

Housing, Other

—

Pipe Support Structure

▲

Sewage Pumping Facility

⊠

Sewer Facility Connection Inlet / Outlet

■

Blind Shaft

●

Combined Use Manhole

⊠

Flushing Chamber

●

Foul Use Manhole

●

Grease Trap

+

Head Node

—

Hydrobrake

□

Lamphole

□

Overflow

—

Penstock

⊕

Petrol Interceptor

★

Sewer Blockage

☆

Sewer Collapse
- Sewer Chemical Injection Point
- Sewer Junction
- ◆

Sewerage Air Valve
- ||

Sewerage Hatch Box Point
- Sewerage Isolation Valve
- ⊕

Soakaway
- Surface Water Manhole
- Vent Column
- Waste Water Storage
- Culverted Watercourse
- +++++

Pre-1937 Properties

MATERIALS

- AC

- ASBESTOS CEMENT
- BR

- BRICK
- CC

- CONCRETE BOX CULVERT
- CI

- CAST IRON
- CO

- CONCRETE
- CSB

- CONCRETE SEGMENTS (BOLTED)
- CSU

- CONCRETE SEGMENTS (UNBOLTED)
- DI

- DUCTILE IRON
- GRC

- GLASS REINFORCED CONCRETE
- MAC

- MASONRY IN REGULAR COURSES
- MAR

- MASONRY RANDOMLY COURSED
- PE

- POLYETHYLENE
- PF

- PITCH
- PP

- POLYPROPYLENE
- PSC

- PLASTIC STEEL COMPOSITE
- PVC

- POLYVINYL CHLORIDE
- RPM

- REINFORCED PLASTIC MATRIX
- SI

- SPUN (GREY) IRON
- XXX

- OTHER

All Private Sewers are shown in magenta

All section 104 sewers are shown in green

All Sewers that have been transferred to Severn Trent Water after the 1st October 2011, but have not been surveyed and confirmed by Severn Trent Water are shown in orange

CATEGORIES

- W

- WEIR
- C

- CASCADE
- DB

- DAMBOARD
- SE

- SIDE ENTRY
- FV

- FLAP VALVE
- BD

- BACK DROP
- S

- SIPHON
- HD

- HIGHWAY DRAIN
- S104

- SECTION 104
- C

- CIRCULAR
- E

- EGG SHAPED
- O

- OTHER
- R

- RECTANGLE
- S

- SQUARE
- T

- TRAPEZOIDAL
- U

- UNKNOWN

TABULAR KEY

- A.

 Sewer pipe data refers to downstream sewer pipe.
- B.

 Where the node bifurcates (splits) X and Y indicates downstream sewer pipe.
- C.

 Gradient is stated a 1 in...

PURPOSE

- C

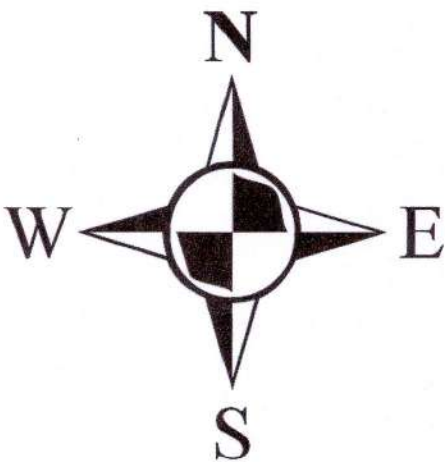
- COMBINED
- E

- FINAL EFFLUENT
- F

- FOUL
- L

- SLUDGE
- S

- SURFACE WATER



Severn Trent Water Limited
Asset Data Management
PO Box 5344
Coventry
CV3 9FT
Telephone: 0845 601 6616

SEWER RECORD (TABULAR)

O/S Map scale: 1:1250

Date of issue: 01.11.16

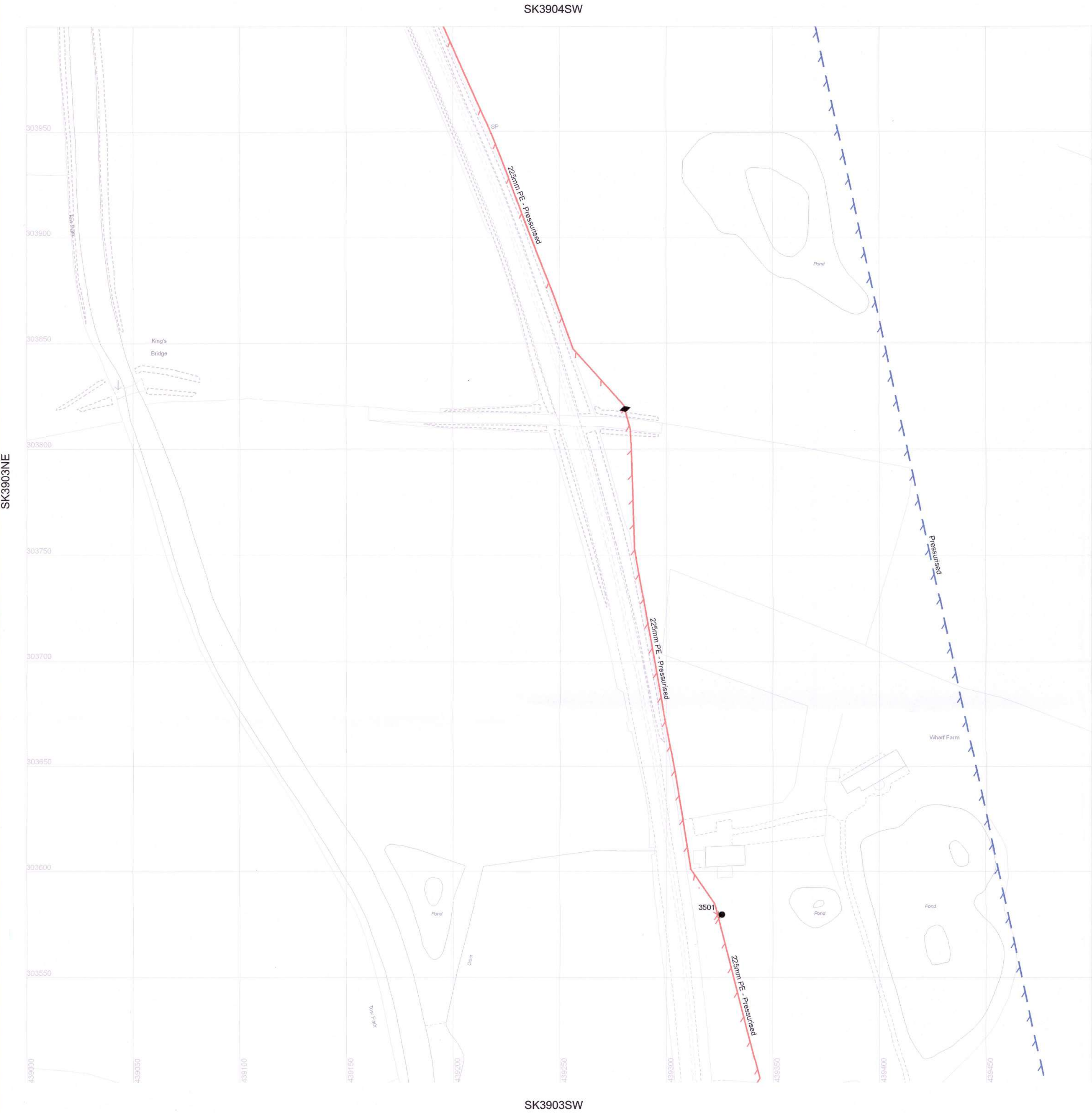
Sheet No. 1 of 1

This map is centred upon:
O / S Tile reference:

SK3903NE

Disclaimer Statement:

1. Do not scale off this Map.
2. This map and any information supplied with it is furnished as a general guide, is only valid at the date of issue and no warranty as to its correctness is given or implied. In particular this Map and any information shown on it must not be relied upon in the event of any development or works (including but not limited to excavations) in the vicinity of Severn Trent Water's assets or for the purposes of determining the suitability of a point of connection to the sewerage or distribution systems.
3. On 1 October 2011 most private sewers and private lateral drains in Severn Trent Water's sewerage area, which were connected to a public sewer as at 1 July 2011, transferred to the ownership of Severn Trent Water and became public sewers and public lateral drains. A further transfer takes place on 1 October 2012 (date to be confirmed). Private pumping stations, which form part of these sewers or lateral drains, will transfer to the ownership of Severn Trent Water on or before 1 October 2016. Severn Trent Water does not possess complete records of these assets. These assets may not be displayed on this Map.
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- ✕✕✕✕ Abandoned Sewer

Private Combined Gravity Sewer

Private Foul Gravity Sewer

Private Surface Water Gravity Sewer

Public Combined Gravity Sewer

Public Foul Gravity Sewer

Public Surface Water Gravity Sewer

Trunk Combined Gravity Sewer

Trunk Foul Use Gravity Sewer

Trunk Surface Water Gravity Sewer

Combined Use Pressurised Sewer

Foul Use Pressurised Sewer

Surface Water Pressurised Sewer

Highway Drain

Combined Lateral Drain (SS)

Foul Lateral Drain (SS)

Surface Water Lateral Drain (SS)

○-○-○ Cable, Earthing

○ Cable Junction

----- Cable, Optical Fibre/Instrumentation

----- Cable, Low Voltage

----- Cable, High Voltage

+++++ Cable, Other

B

Housing, Building

K

Housing, Kiosk

L

Disposal Site

T

Sewage Treatment Works

●

Housing, Other

—

Pipe Support Structure

▲

Sewage Pumping Facility

⊠

Sewer Facility Connection Inlet / Outlet

■ Blind Shaft

● Combined Use Manhole

□ Flushing Chamber

● Foul Use Manhole

● Grease Trap

• Head Node

≡ Hydrobrake

□ Lamphole

□ Outfall

□ Penstock

⊕ Petrol Interceptor

★ Sewer Blockage

☆ Sewer Collapse

— Sewer Chemical Injection Point

▪ Sewer Junction

◆ Sewerage Air Valve

▮ Sewerage Hatch Box Point

— Sewerage Isolation Valve

⊕ Soakaway

○ Surface Water Manhole

■ Vent Column

■ Waste Water Storage

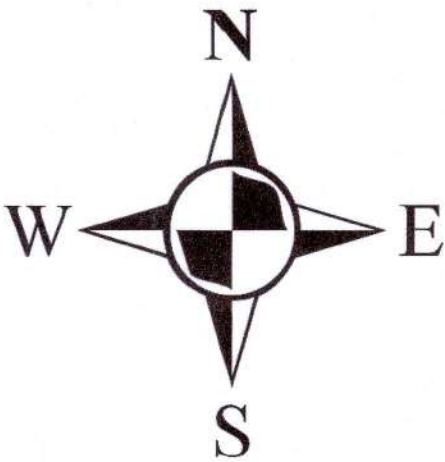
▬ Culverted Watercourse

--- Pre-1937 Properties

MATERIALS	
AC	- ASBESTOS CEMENT
BR	- BRICK
CC	- CONCRETE BOX CULVERT
CI	- CAST IRON
CO	- CONCRETE
CSB	- CONCRETE SEGMENTS (BOLTED)
CSU	- CONCRETE SEGMENTS (UNBOLTED)
DI	- DUCTILE IRON
GRC	- GLASS REINFORCED CONCRETE
MAC	- MASONRY IN REGULAR COURSES
MAR	- MASONRY RANDOMLY COURSED
PE	- POLYETHYLENE
PF	- PITCH
PP	- POLYPROPYLENE
PVC	- PLASTIC STEEL COMPOSITE
RPM	- REINFORCED PLASTIC MATRIX
SI	- SPUN (GREY) IRON
XXX	- OTHER
All Private Sewers are shown in magenta	
All section 104 sewers are shown in green	
All Sewers that have been transferred to Severn Trent Water after the 1 st October 2011, but have not been surveyed and confirmed by Severn Trent Water are shown in orange	

CATEGORIES	
W	- WEIR
C	- CASCADE
DB	- DAMBOARD
SE	- SIDE ENTRY
FV	- FLAP VALVE
BD	- BACK DROP
S	- SIPHON
HD	- HIGHWAY DRAIN
S104	- SECTION 104
SHAPE	
C	- CIRCULAR
E	- EGG SHAPED
O	- OTHER
R	- RECTANGLE
S	- SQUARE
T	- TRAPEZOIDAL
U	- UNKNOWN

TABULAR KEY	
A.	Sewer pipe data refers to downstream sewer pipe.
B.	Where the node bifurcates (splits) X and Y indicates downstream sewer pipe.
C.	Gradient is stated as 1 in...
PURPOSE	
C	- COMBINED
E	- FINAL EFFLUENT
F	- FOUL
L	- SLUDGE
S	- SURFACE WATER



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SEWER RECORD (TABULAR)

O/S Map scale:	1:1250	This map is centred upon:	
Date of issue:	01.11.16	O / S Tile reference:	
Sheet No.	1 of 1		SK3903NW

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SK3903NE



Server Node		Sewer Pipe Data								
REFERENCE	COVER LEVEL	INV LEVEL UPSTR	INV LEVEL DNSTR	PURP	MATL	SHAPE	MAX SIZE	MIN SIZE	GRADIENT	YEAR LAID
SC00300001	103.26	101.95	101.84	S	CO	C	375	nil	66.18	nil
SC00300002	102.96	101.19	100.73	F	VC	C	150	nil	52.89	nil
SC00300003	103.11	101.77	101.63	S	CO	C	375	nil	54.43	nil
SC00300004	102.82	101.49	99.79	S	CO	C	450	nil	10.65	nil
SC00300005	102.13	100.72	nil	F	VC	C	150	nil	0.00	nil
SC00300006	nil	nil	98.88	F	nil	nil	nil	nil	0.00	nil
SC00300008	100.32	98.67	98.43	F	VC	C	150	nil	48.22	nil
SC00300021	88.77	97.51	97.12	C	VC	C	300	nil	272.54	nil
SC00300041	99.35	97.94	97.51	C	VC	C	300	nil	259.47	nil
SC00300042	99.76	98.31	97.94	C	VC	C	300	nil	294.22	nil
SC00300061	108.02	106.04	105.89	S	VC	C	150	nil	33.33	nil
SC00300062	108.08	105.74	105.28	F	VC	C	150	nil	36.96	nil
SC00300063	106.60	105.02	103.30	S	VC	C	nil	nil	25.10	nil
SC00300064	103.81	103.25	102.88	F	VC	C	150	nil	69.65	nil
SC00300065	104.75	102.75	101.20	S	CO	C	150	nil	92.45	nil
SC00300066	104.07	103.21	102.42	S	CO	C	300	nil	30.89	nil
SC00300067	105.47	104.52	103.21	S	CO	C	300	nil	23.77	nil
SC00300067	105.47	103.82	103.79	S	CO	C	375	nil	105.33	nil
SC00300068	105.29	103.74	101.95	S	CO	C	375	nil	48.20	nil
SC00300069	103.73	102.41	102.00	S	CO	C	300	nil	56.15	nil
SC00300010	107.80	105.86	105.04	S	VC	C	150	nil	31.91	nil
SC00300011	107.30	105.26	105.03	F	VC	C	150	nil	48.61	nil
SC00300016	106.84	105.08	97.29	F	VC	C	175	nil	21.65	nil
SC00300071	106.94	105.05	104.41	S	CO	C	300	nil	31.28	nil
SC00300072	107.71	105.86	104.41	F	VC	C	150	nil	45.60	nil
SC00300073	106.47	104.38	102.76	F	VC	C	nil	nil	33.48	nil
SC00300074	106.25	104.37	103.82	S	CO	C	300	nil	67.67	nil
SC00300075	107.83	106.23	105.05	S	CO	C	300	nil	39.19	nil
SC00300081	109.28	107.59	106.26	S	CO	C	300	nil	32.57	nil
SC00300082	109.95	107.81	107.84	S	VC	C	225	nil	36.06	nil
SC00300084	110.73	108.67	107.81	S	CO	C	300	nil	20.36	nil
SC00300084	110.26	108.69	105.87	F	VC	C	150	nil	21.90	nil
SC00300085	111.04	109.46	108.73	F	VC	C	150	nil	21.68	nil
SC00300086	111.03	109.56	108.73	F	VC	C	150	nil	46.36	nil
SC00300087	112.79	110.34	107.89	S	VC	C	225	nil	20.10	nil
SC00300811	110.60	110.43	110.59	S	VC	C	225	nil	17.43	nil
SC00300812	118.54	115.78	105.14	F	VC	C	175	nil	21.15	nil
SC00300000	nil	nil	nil	F	VC	U	150	nil	0.00	nil
SC00300001	114.53	112.51	108.68	S	CO	C	300	nil	16.28	nil
SC00300002	114.72	112.60	109.52	F	VC	C	150	nil	20.56	nil
SC00300003	117.45	115.51	112.62	F	VC	C	150	nil	10.18	nil
SC00300004	117.13	114.89	112.62	S	VC	C	225	nil	15.19	nil
SC00300005	116.06	114.52	112.72	F	VC	C	150	nil	23.37	nil
SC00300006	116.12	114.23	112.53	S	CO	C	300	nil	32.74	nil
SC00300007	116.25	114.94	114.53	F	VC	C	150	nil	40.88	nil
SC00300008	116.15	114.39	114.01	S	VC	C	225	nil	0.00	nil
SC00300009	117.17	115.71	115.71	nil	S	VC	C	150	0.00	nil
SC00300010	117.12	115.55	114.95	F	VC	C	150	nil	27.33	nil
SC00300011	117.77	115.63	115.77	S	VC	C	180	nil	9.81	nil
SC00300911	117.01	115.04	114.46	S	VC	C	150	nil	114.12	nil
SC00300912	116.46	115.31	114.40	F	VC	C	150	nil	75.68	nil
SC00300913	116.63	114.77	114.40	S	VC	C	225	nil	63.11	nil
SC00300914	119.10	117.51	114.80	S	VC	C	150	nil	14.20	nil
SC00300915	119.82	116.74	115.80	F	VC	C	175	nil	41.31	nil
nil	nil	nil	nil	F	VC	nil	nil	nil	0.00	nil

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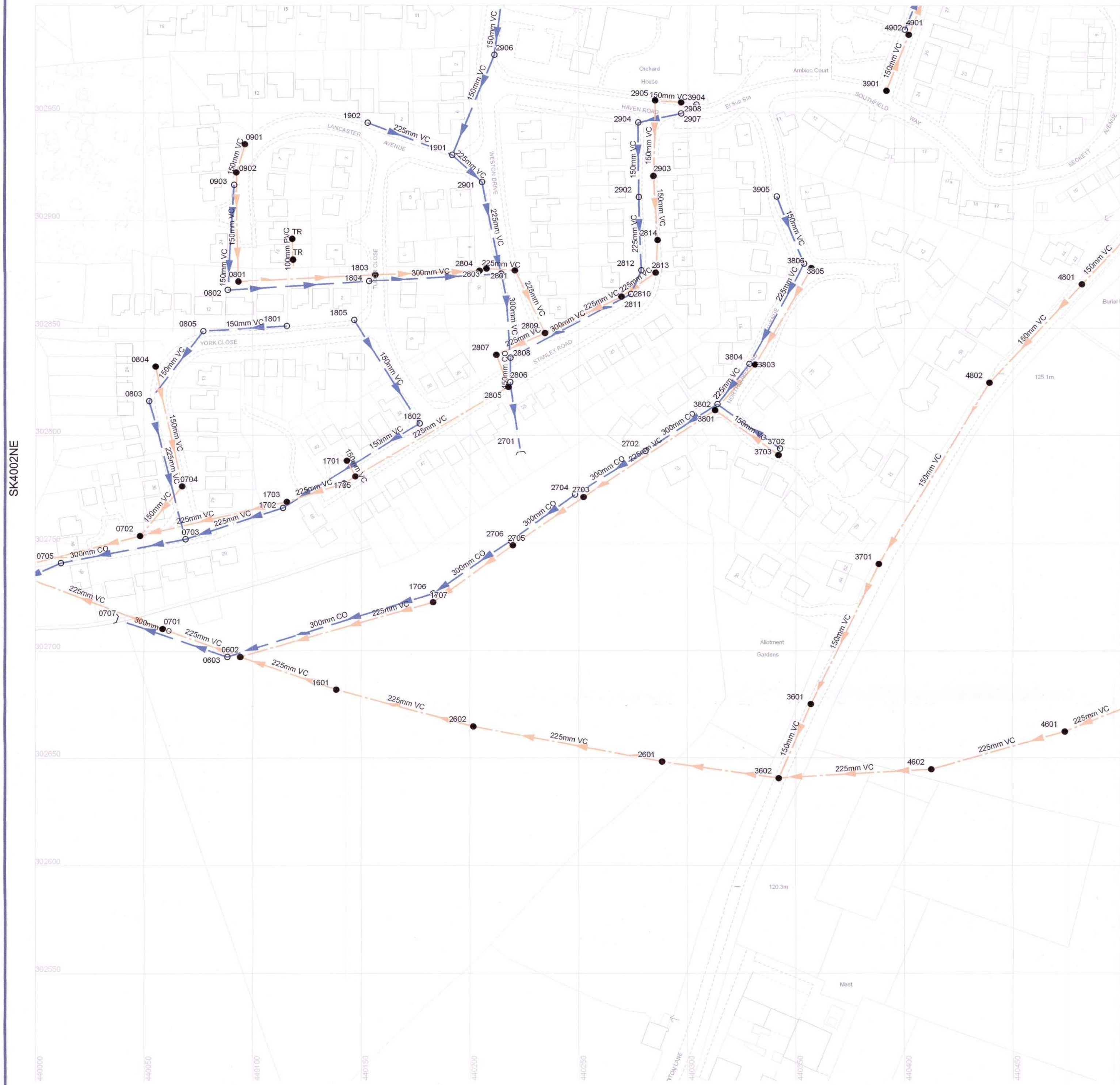
Private pumping stations, which form part of these sewers or lateral drains, will transfer to the ownership of Severn Trent Water on 1 October 2012.

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SK4003SW



SK4002SW

	Abandoned Sewer		Blind Shaft
	Private Combined Gravity Sewer		Combined Use Manhole
	Private Foul Gravity Sewer		Flushing Chamber
	Private Surface Water Gravity Sewer		Foul Use Manhole
	Public Combined Gravity Sewer		Grease Trap
	Public Foul Gravity Sewer		Head Node
	Public Surface Water Gravity Sewer		Hydrobrake
	Trunk Combined Gravity Sewer		Lamphole
	Trunk Foul Use Gravity Sewer		Outfall
	Trunk Surface Water Gravity Sewer		Overflow
	Combined Use Pressurised Sewer		Penstock
	Foul Use Pressurised Sewer		Petrol Interceptor
	Surface Water Pressurised Sewer		Sewer Blockage
	Highway Drain		Sewer Collapse
	Combined Lateral Drain (SS)		
	Foul Lateral Drain (SS)		
	Surface Water Lateral Drain (SS)		
	Cable, Earthing		
	Cable Junction		
	Cable, Optical Fibre/Instrumentation		
	Cable, Low Voltage		
	Cable, High Voltage		
	Cable, Other		
	Housing, Building		
	Housing, Kiosk		
	Disposal Site		
	Sewage Treatment Works		
	Housing, Other		
	Pipe Support Structure		
	Sewage Pumping Facility		
	Sewer Facility Connection Inlet / Outlet		

MATERIALS

AC	ASBESTOS CEMENT
BR	BRICK
CC	CONCRETE BOX CULVERT
CI	CAST IRON
CO	CONCRETE
CSB	CONCRETE SEGMENTS (BOLTED)
CSU	CONCRETE SEGMENTS (UNBOLTED)
DI	DUCTILE IRON
GRC	GLASS REINFORCED CONCRETE
MAC	MASONRY IN REGULAR COURSES
MAR	MASONRY RANDOMLY COURSED
PE	POLYETHYLENE
PF	PITCH
PP	POLYPROPYLENE
PSC	PLASTIC STEEL COMPOSITE
PVC	POLYVINYL CHLORIDE
RPM	REINFORCED PLASTIC MATRIX
SI	SPUN (GREY) IRON
XXX	OTHER

All Private Sewers are shown in magenta

All section 104 sewers are shown in green

All Sewers that have been transferred to Severn Trent Water after the 1st October 2011, but have not been surveyed and confirmed by Severn Trent Water are shown in orange

CATEGORIES

W	WEIR
C	CASCADE
DB	DAMBOARD
SE	SIDE ENTRY
FV	FLAP VALVE
BD	BACK DROP
S	SIPHON
HD	HIGHWAY DRAIN
S104	SECTION 104

SHAPE

C	CIRCULAR
E	EGG SHAPED
O	OTHER
R	RECTANGLE
S	SQUARE
T	TRAPEZOIDAL
U	UNKNOWN

TABULAR KEY

- A. Sewer pipe data refers to downstream sewer pipe.
B. Where the node bifurcates (splits) X and Y indicates downstream sewer pipe.
C. Gradient is stated a 1 in...

PURPOSE

C	COMBINED
E	FINAL EFFLUENT
F	FOUL
L	SLUDGE
S	SURFACE WATER

Sewer Node	COVER LEVEL	IN LEVEL UPSTR	IN LEVEL DOWNSTR	PURP	MATL	SHAPE	MAX SIZE	MIN SIZE	GRADIENT	YEAR LAID
SK4002062	113.46	111.59	108.99	F	VC	C	225	nil	14.57	nil
SK4002063	113.36	109.98	108.88	S	CO	C	300	nil	47.35	nil
SK4002071	111.16	108.96	nil	F	VC	C	225	nil	0.00	nil
SK4002072	110.58	106.40	nil	F	VC	C	225	nil	0.00	nil
SK4002073	111.07	106.95	106.62	S	CO	C	300	nil	23.41	nil
SK4002074	113.37	110.27	108.99	F	VC	C	150	nil	23.30	nil
SK4002075	108.36	106.56	104.80	S	CO	C	300	nil	13.68	nil
SK4002081	120.89	nil	118.97	F	nil	nil	nil	nil	0.00	nil
SK4002082	120.61	nil	119.61	S	nil	nil	nil	nil	0.00	nil
SK4002083	114.09	111.00	109.12	S	VC	C	225	nil	35.74	nil
SK4002084	115.14	112.83	110.31	F	VC	C	150	nil	22.81	nil
SK4002085	116.90	113.80	111.09	S	VC	C	150	nil	14.99	nil
SK4002091	124.07	122.23	121.84	F	VC	C	150	nil	34.87	nil
SK4002092	123.57	120.28	nil	F	VC	C	150	nil	0.00	nil
SK4002093	123.39	121.48	nil	S	VC	C	150	nil	0.00	nil
SK40021601	114.96	112.44	111.63	F	VC	C	225	nil	57.74	nil
SK40021701	114.61	113.70	nil	F	VC	C	150	nil	0.00	nil
SK40021702	113.38	110.80	109.12	S	VC	C	225	nil	28.99	nil
SK40021703	113.44	110.35	109.26	F	VC	C	225	nil	64.30	nil
SK40021704	114.14	111.68	111.37	F	VC	C	225	nil	66.87	nil
SK40021705	nil	112.89	112.89	F	nil	nil	nil	nil	0.00	nil
SK40021706	113.08	111.45	111.37	S	CO	C	300	nil	1246.63	nil
SK40021707	113.89	111.32	111.68	F	VC	C	225	nil	0.00	nil
SK40021801	118.70	116.10	113.95	S	VC	C	150	nil	18.16	nil
SK40021802	116.41	114.68	110.89	S	VC	C	150	nil	19.41	nil
SK40021803	121.70	118.97	118.62	F	VC	C	225	nil	140.11	nil
SK40021804	121.76	119.59	119.00	S	VC	C	300	nil	107.27	nil
SK40021805	120.47	117.35	114.74	S	VC	C	150	nil	21.89	nil
SK40021901	124.98	123.11	122.50	S	VC	C	225	nil	31.49	nil
SK40021902	124.82	123.83	123.14	S	VC	C	225	nil	60.57	nil
SK40022601	120.45	115.84	115.72	F	VC	C	225	nil	402.09	nil
SK40022602	117.43	115.64	112.45	F	VC	C	225	nil	20.76	nil
SK40022702	119.77	117.36	115.99	S	CO	C	300	nil	26.93	nil
SK40022703	117.47	115.70	112.50	F	VC	C	225	nil	12.57	nil
SK40022704	117.26	115.96	112.86	S	CO	C	300	nil	12.00	nil
SK40022705	115.00	112.48	111.35	F	VC	C	225	nil	39.30	nil
SK40022706	114.94	112.81	111.59	S	CO	C	300	nil	34.79	nil
SK40022801	121.84	112.46	117.83	F	VC	C	225	nil	62.96	nil
SK40022802	121.83	118.92	116.72	S	VC	C	300	nil	13.61	nil
SK40022803	122.01	118.60	118.49	F	VC	C	225	nil	109.45	nil
SK40022804	121.85	118.61	118.60	F	VC	C	225	nil	316.00	nil
SK40022805	117.70	114.34	nil	F	VC	C	225	nil	0.00	nil
SK40022806	117.74	116.22	nil	S	CO	C	450	nil	0.00	nil
SK40022807	118.49	116.26	114.50	F	VC	C	225	nil	8.98	nil
SK40022808	118.11	116.76	116.23	S	CO	C	450	nil	20.75	nil
SK40022809	119.05	116.65	116.34	F	VC	C	225	nil	76.68	nil
SK40022810	121.06	118.50	116.80	S	VC	C	300	nil	36.85	nil
SK40022811	121.03	117.53	116.67	F	VC	C	225	nil	45.77	nil
SK40022812	121.81	118.80	118.57	S	VC	C	225	nil	52.52	nil
SK40022813	121.84	117.94	117.54	F	VC	C	225	nil	46.50	nil
SK40022814	122.71	120.48	120.28	F	VC	C	225	nil	75.65	nil
SK40022901	124.73	122.43	120.24	S	VC	C	225	nil	24.18	nil
SK40022902	124.07	122.55	120.27	S	VC	C	225	nil	14.92	nil
SK40022903	124.83	121.12	120.51	F	VC	C	160	nil	49.90	nil
SK40022904	126.76	124.96	122.70	S	VC	C	150	nil	15.05	nil
SK40022905	127.24	124.53	123.07	F	VC	C	150	nil	23.33	nil
SK40022906	126.96	125.10	123.24	S	VC	C	150	nil	27.19	nil
SK40022907	127.37	125.86	124.99	S	VC	C	150	nil	24.57	nil
SK40022908	127.28	125.73	125.62	F	VC	C	150	nil	109.45	nil
SK40023601	121.52	119.74	nil	F	VC	C	nil	nil	0.00	nil
SK40023602	nil	115.95	115.95	F	nil	nil	nil	nil	0.00	nil
SK40023701	122.87	121.03	119.75	F	VC	C	nil	nil	56.97	nil
SK40023702	122.73	121.06	119.02	S	VC	C	150	nil	17.16	nil
SK40023703	122.59	120.56	118.52	F	VC	C	150	nil	17.16	nil
SK40023801	121.04	118.45	115.77	F	VC	C	225	nil	26.70	nil
SK40023802	121.08	118.81	117.41	S	CO	C	300	nil	28.54	nil
SK40023803	122.12	119.46	118.53	F	VC	C	225	nil	30.57	nil
SK40023804	122.07	119.39	118.98	S	VC	C	225	nil	24.08	nil
SK40023805	124.74	122.76	120.00	S	VC	C	225	nil	16.97	nil
SK40023806	124.76	122.09	119.52	F	VC	C	225	nil	19.89	nil
SK40023901	128.13	127.89	127.60	F	VC	C	150	nil	103.72	nil
SK40023904	127.53	125.90	125.85	S	VC	C	150	nil	178.80	nil
SK40023905	125.81	124.18	122.88	S	VC	C	150	nil	26.29	nil
SK40024601	119.30	116.95	116.69	F	VC	C	225	nil	243.31	nil
SK40024602	116.95	116.62	nil	F	VC	C	225	nil	0.00	nil
SK40024601	126.51	124.52	122.71	F	VC	C	nil	nil	34.39	nil
SK40024602	125.02	122.68	121.05	F	VC	C	nil	nil	60.61	nil
SK40024901	129.81	127.83	127.40	S	VC	C	225	nil	88.02	nil
SK40024902	129.78	127.55	127.20	F	VC	C	150	nil	138.49	nil
HI	nil	nil	nil	F	PVC	nil	nil	nil	0.00	nil



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SEWER RECORD (TABULAR)

O/S Map scale: 1:1250

Date of issue: 01.11.16

Sheet No. 1 of 1

This map is centred upon:
O / S Tile reference:

SK4002NW

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SK3903NW

SK3803SE

SK3903SE

SK3902NW

Sewer Node		Sewer Pipe Data									
REFERENCE	COVER LEVEL	INV LEVEL UPSTR	INV LEVEL DOWNSTR	PURP	MATL	SHAPE	MAX SIZE	MIN SIZE	GRADIENT	YEAR LAID	
SK39031301	nil	nil	nil	S	nil	nil	nil	nil	0.00	2004	
SK39032206	nil	nil	nil	S	nil	nil	nil	nil	0.00	2004	
SK39032207	nil	nil	nil	F	nil	nil	nil	nil	0.00	2004	
SK39032301	nil	nil	nil	F	nil	nil	nil	nil	0.00	2004	
SK39032301	nil	nil	nil	F	nil	nil	nil	nil	0.00	2004	
SK39032302	nil	nil	nil	F	nil	nil	nil	nil	0.00	2004	
SK39032303	nil	nil	nil	S	nil	nil	nil	nil	0.00	2004	
SK39032303	nil	nil	nil	S	nil	nil	nil	nil	0.00	2004	
SK39032304	nil	nil	nil	S	nil	nil	nil	nil	0.00	2004	
SK39032305	nil	nil	nil	S	nil	nil	nil	nil	0.00	2004	
SK39032306	nil	nil	nil	F	nil	nil	nil	nil	0.00	2004	
SK39032401	nil	nil	nil	S	nil	nil	nil	nil	0.00	2004	
SK39032402	nil	nil	nil	F	nil	nil	nil	nil	0.00	2004	
SK39032404	nil	nil	nil	S	nil	nil	nil	nil	0.00	2004	
SK39033101	nil	nil	nil	F	nil	nil	nil	nil	0.00	nil	
SK39034001	99.11	96.58	96.19	C	VC	C	300	nil	260.31	nil	
SK39034002	99.12	96.62	96.59	C	VC	C	300	nil	298.00	nil	
SK39034101	99.12	97.12	96.69	C	VC	C	nil	nil	225.28	nil	
SK39034101	99.12	nil	nil	C	VC	nil	nil	nil	0.00	nil	
SK39034102	nil	nil	97.29	F	VC	C	225	nil	0.00	nil	
SK39034103	99.13	97.12	97.07	C	VC	C	300	nil	117.00	nil	

- Abandoned Sewer
- Private Combined Gravity Sewer
- Private Foul Gravity Sewer
- Private Surface Water Gravity Sewer
- Public Combined Gravity Sewer
- Public Foul Gravity Sewer
- Public Surface Water Gravity Sewer
- Trunk Combined Gravity Sewer
- Trunk Foul Use Gravity Sewer
- Trunk Surface Water Gravity Sewer
- Combined Use Pressurised Sewer
- Foul Use Pressurised Sewer
- Surface Water Pressurised Sewer
- Highway Drain
- Combined Lateral Drain (SS)
- Foul Lateral Drain (SS)
- Surface Water Lateral Drain (SS)

- Cable, Earthing
- Cable Junction
- Cable, Optical Fibre/Instrumentation
- Cable, Low Voltage
- Cable, High Voltage
- Cable, Other
- Housing, Building
- Housing, Kiosk
- Disposal Site
- Sewage Treatment Works
- Housing, Other
- Pipe Support Structure
- Sewage Pumping Facility
- Sewer Facility Connection Inlet / Outlet

- Blind Shaft
- Combined Use Manhole
- Flushing Chamber
- Foul Use Manhole
- Grease Trap
- Head Node
- Hydrobrake
- Lamphole
- Outfall
- Overflow
- Penstock
- Petrol Interceptor
- Sewer Blockage
- Sewer Collapse
- Sewer Chemical Injection Point
- Sewer Junction
- Sewerage Air Valve
- Sewerage Hatch Box Point
- Sewerage Isolation Valve
- Soakaway
- Surface Water Manhole
- Vent Column
- Waste Water Storage
- Culverted Watercourse
- Pre-1937 Properties

MATERIALS

- AC - ASBESTOS CEMENT
- BR - BRICK
- CC - CONCRETE BOX CULVERT
- CI - CAST IRON
- CO - CONCRETE
- CSB - CONCRETE SEGMENTS (BOLTED)
- CSU - CONCRETE SEGMENTS (UNBOLTED)
- DI - DUCTILE IRON
- GRC - GLASS REINFORCED CONCRETE
- MAC - MASONRY IN REGULAR COURSES
- MAR - MASONRY RANDOMLY COURSED
- PE - POLYETHYLENE
- PF - PITCH
- PP - POLYPROPYLENE
- PSC - PLASTIC STEEL COMPOSITE
- PVC - POLYVINYL CHLORIDE
- RPM - REINFORCED PLASTIC MATRIX
- SI - SPUN (GREY) IRON
- XXX - OTHER

All Private Sewers are shown in magenta

All section 104 sewers are shown in green

All sewers that have been transferred to Severn Trent Water after the 1st October 2011, but have not been surveyed and confirmed by Severn Trent Water are shown in orange

CATEGORIES

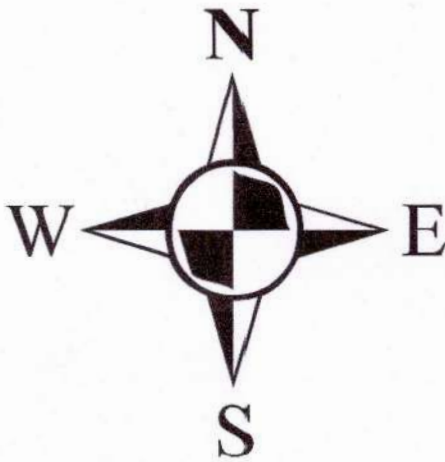
- W - WEIR
- C - CASCADE
- DB - DAMBOARD
- SE - SIDE ENTRY
- FV - FLAP VALVE
- BD - BACK DROP
- S - SIPHON
- HD - HIGHWAY DRAIN
- S104 - SECTION 104
- SHAPE
- C - CIRCULAR
- E - EGG SHAPED
- O - OTHER
- R - RECTANGLE
- S - SQUARE
- T - TRAPEZOIDAL
- U - UNKNOWN

TABULAR KEY

- A. Sewer pipe data refers to downstream sewer pipe.
- B. Where the node bifurcates (splits) X and Y indicates downstream sewer pipe.
- C. Gradient is stated a 1 in...

PURPOSE

- C - COMBINED
- E - FINAL EFFLUENT
- F - FOUL
- L - SLUDGE
- S - SURFACE WATER



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Asset Data Management
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SEWER RECORD (TABULAR)

O/S Map scale: 1:1250

Date of issue: 01.11.16

Sheet No. 1 of 1

This map is centred upon:
O / S Tile reference:

SK3903SW

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SK4004SW

Sewer Node		Sewer Pipe Data									
REFERENCE	COVER LEVEL	INV LEVEL UPSTR	INV LEVEL DOWNSTR	PURP	MATL	SHAPE	MAX SIZE	MIN SIZE	GRADIENT	YEAR LAID	
SK40030501	106.06	104.48	103.06	G	VC	C	300	nil	58.77	nil	
SK40030501	104.45	103.06	102.38	G	VC	C	300	nil	118.28	nil	
SK40031501	107.12	105.70	104.50	G	VC	C	300	nil	92.23	nil	
SK40034501	113.28	111.46	nil	G	VC	C	150	nil	0.00	nil	

SK4003NE

SK4103NE

SK4003SW

- ✕✕✕✕ Abandoned Sewer

Private Combined Gravity Sewer

Private Foul Gravity Sewer

Private Surface Water Gravity Sewer

Public Combined Gravity Sewer

Public Foul Gravity Sewer

Public Surface Water Gravity Sewer

Trunk Combined Gravity Sewer

Trunk Foul Use Gravity Sewer

Trunk Surface Water Gravity Sewer

Combined Use Pressurised Sewer

Foul Use Pressurised Sewer

Surface Water Pressurised Sewer

Highway Drain

Combined Lateral Drain (SS)

Foul Lateral Drain (SS)

Surface Water Lateral Drain (SS)

○—○—○ Cable, Earthing

○ Cable Junction

--- Cable, Optical Fibre/Instrumentation

--- Cable, Low Voltage

--- Cable, High Voltage

--- Cable, Other

B

Housing, Building

K

Housing, Kiosk

LC

Disposal Site

STW

Sewage Treatment Works

●

Housing, Other

—

Pipe Support Structure

▲

Sewage Pumping Facility

⊠

Sewer Facility Connection Inlet / Outlet
- Blind Shaft

●

Combined Use Manhole

⬜

Flushing Chamber

●

Foul Use Manhole

●

Grease Trap

+

Head Node

—

Hydrobrake

□

Lamphole

⬜

Overflow

≡

Penstock

⊕

Petrol Interceptor

★

Sewer Blockage

☆

Sewer Collapse
- Sewer Chemical Injection Point
- Sewer Junction
- ◆

Sewerage Air Valve
- ⬜

Sewerage Hatch Box Point
- Sewerage Isolation Valve
- ⊕

Soakaway
- Surface Water Manhole
- Vent Column
- Waste Water Storage
- Culverted Watercourse
- Pre-1937 Properties

MATERIALS

- AC

- ASBESTOS CEMENT
- BR

- BRICK
- CC

- CONCRETE BOX CULVERT
- CI

- CAST IRON
- CO

- CONCRETE
- CSB

- CONCRETE SEGMENTS (BOLTED)
- CSU

- CONCRETE SEGMENTS (UNBOLTED)
- DI

- DUCTILE IRON
- GRC

- GLASS REINFORCED CONCRETE
- MAC

- MASONRY IN REGULAR COURSES
- MAR

- MASONRY RANDOMLY COURSED
- PE

- POLYETHYLENE
- PF

- PITCH
- PP

- POLYPROPYLENE
- PSC

- PLASTIC STEEL COMPOSITE
- PVC

- POLYVINYL CHLORIDE
- RPM

- REINFORCED PLASTIC MATRIX
- SI

- SPUN (GREY) IRON
- XXX

- OTHER

All Private Sewers are shown in magenta

All section 104 sewers are shown in green

All Sewers that have been transferred to Severn Trent Water after the 1st October 2011, but have not been surveyed and confirmed by Severn Trent Water are shown in orange

CATEGORIES

- W

- WEIR
- C

- CASCADE
- DB

- DAMBOARD
- SE

- SIDE ENTRY
- FV

- FLAP VALVE
- BD

- BACK DROP
- S

- SIPHON
- HD

- HIGHWAY DRAIN
- S104

- SECTION 104
- C

- CIRCULAR
- E

- EGG SHAPED
- O

- OTHER
- R

- RECTANGLE
- S

- SQUARE
- T

- TRAPEZOIDAL
- U

- UNKNOWN

TABULAR KEY

- A.

Sewer pipe data refers to downstream sewer pipe.
- B.

Where the node bifurcates (splits) X and Y indicates downstream sewer pipe.
- C.

Gradient is stated a 1 in...

PURPOSE

- C

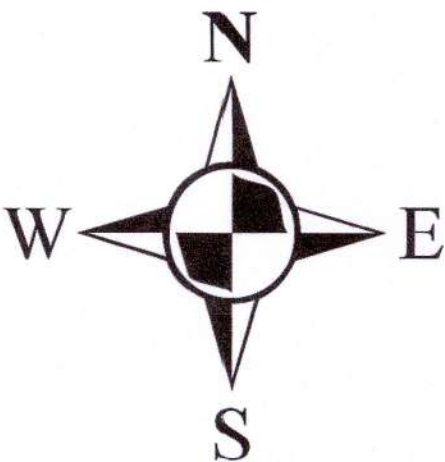
- COMBINED
- E

- FINAL EFFLUENT
- F

- FOUL
- L

- SLUDGE
- S

- SURFACE WATER



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SEWER RECORD (TABULAR)

O/S Map scale: 1:1250

Date of issue: 01.11.16

Sheet No. 1 of 1

This map is centred upon:
O / S Tile reference:

SK4003NW

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SK4003NE



SK4002NE

- Abandoned Sewer

Private Combined Gravity Sewer

Private Foul Gravity Sewer

Private Surface Water Gravity Sewer

Public Combined Gravity Sewer

Public Foul Gravity Sewer

Public Surface Water Gravity Sewer

Trunk Combined Gravity Sewer

Trunk Foul Use Gravity Sewer

Trunk Surface Water Gravity Sewer

Combined Use Pressurised Sewer

Foul Use Pressurised Sewer

Surface Water Pressurised Sewer

Highway Drain

Combined Lateral Drain (SS)

Foul Lateral Drain (SS)

Surface Water Lateral Drain (SS)

Cable, Earthing

Cable Junction

Cable, Optical Fibre/Instrumentation

Cable, Low Voltage

Cable, High Voltage

Cable, Other

Housing, Building

Housing, Kiosk

Disposal Site

Sewage Treatment Works

Housing, Other

Pipe Support Structure

Sewage Pumping Facility

Sewer Facility Connection Inlet / Outlet
- Blind Shaft

Combined Use Manhole

Flushing Chamber

Foul Use Manhole

Grease Trap

Head Node

Hydrobrake

Lamphole

Outfall

Overflow

Penstock

Petrol Interceptor

Sewer Blockage

Sewer Collapse

Sewer Chemical Injection Point

Sewer Junction

Sewerage Air Valve

Sewerage Hatch Box Point

Sewerage Isolation Valve

Soakaway

Surface Water Manhole

Vent Column

Waste Water Storage

Culverted Watercourse

Pre-1937 Properties

Sewer Node		Sewer Pipe Data									
REFERENCE	COVER LEVEL	INV LEVEL UPSTR	INV LEVEL DOWNSTR	PURP	MATL	SHAPE	MAX SIZE	MIN SIZE	GRADIENT	YEAR LAID	
SK40035001	130.64	129.01	128.82	F	VC	C	150	nil	93.68	nil	
SK40035002	130.77	129.20	129.02	F	VC	C	150	nil	81.39	nil	
SK40035003	130.33	128.79	128.81	F	VC	C	150	nil	36.09	nil	
SK40035004	130.72	129.01	128.83	F	VC	C	150	nil	62.11	nil	
SK40035005	130.24	128.06	127.42	F	VC	C	150	nil	67.55	nil	
SK40035101	124.12	122.28	122.20	F	VC	C	nil	nil	555.25	nil	
SK40035102	124.25	122.43	122.35	F	VC	C	nil	nil	520.25	nil	
SK40035103	130.47	128.05	121.45	S	VC	C	225	nil	20.35	nil	
SK40035104	124.01	122.80	122.57	F	VC	C	150	nil	1195.00	nil	
SK40035105	130.77	128.49	128.08	F	VC	C	150	nil	86.49	nil	
SK40035106	130.58	128.72	128.52	F	VC	C	150	nil	92.20	nil	
SK40035401	122.42	120.49	119.29	C	VC	C	nil	nil	51.87	nil	
SK40035402	121.72	119.28	111.50	C	VC	C	nil	nil	15.35	nil	
SK40036001	131.01	129.46	129.28	S	VC	C	150	nil	230.22	nil	
SK40036002	130.43	128.58	127.36	F	VC	C	150	nil	24.61	nil	
SK40036003	131.36	129.58	nil	F	VC	C	150	nil	0.00	nil	
SK40036005	130.88	129.59	128.93	S	VC	C	150	nil	33.88	nil	
SK40036006	131.10	129.65	129.63	S	VC	C	150	nil	200.00	nil	
SK40036101	129.05	127.17	126.28	C	VC	C	150	nil	82.03	nil	
SK40036102	129.87	128.90	127.18	C	VC	C	225	nil	17.84	nil	
SK40036103	131.45	129.85	127.20	C	VC	C	150	nil	26.47	nil	
SK40036201	128.84	126.24	123.68	C	VC	C	nil	nil	25.79	nil	
SK40036202	131.45	129.62	128.28	C	VC	C	150	nil	21.47	nil	
SK40036203	122.83	121.43	123.42	S	VC	C	nil	nil	0.00	nil	
SK40036301	125.41	123.65	122.36	C	VC	C	nil	nil	27.63	nil	
SK40036302	124.76	nil	nil	S	VC	nil	225	nil	0.00	nil	
SK40036303	124.20	122.35	120.50	C	VC	C	nil	nil	42.74	nil	
SK40036304	124.77	123.53	122.38	C	VC	C	nil	nil	9.37	nil	
SK40037001	131.48	129.90	129.48	S	VC	C	150	nil	79.14	nil	
SK40037102	132.79	131.08	129.65	C	VC	C	150	nil	36.10	nil	
SK40037103	134.02	132.38	131.10	C	VC	C	150	nil	45.72	nil	
SK40038001	133.09	131.75	130.93	S	VC	C	150	nil	37.65	nil	

MATERIALS

AC	- ASBESTOS CEMENT
BR	- BRICK
CC	- CONCRETE BOX CULVERT
CI	- CAST IRON
CO	- CONCRETE
CSB	- CONCRETE SEGMENTS (BOLTED)
CSU	- CONCRETE SEGMENTS (UNBOLTED)
DI	- DUCTILE IRON
GRC	- GLASS REINFORCED CONCRETE
MAC	- MASONRY IN REGULAR COURSES
MAR	- MASONRY RANDOMLY COURSED
PE	- POLYETHYLENE
PF	- PITCH
PP	- POLYPROPYLENE
PSC	- PLASTIC STEEL COMPOSITE
PVC	- POLYVINYL CHLORIDE
RPM	- REINFORCED PLASTIC MATRIX
SI	- SPUN (GREY) IRON
XXX	- OTHER

CATEGORIES

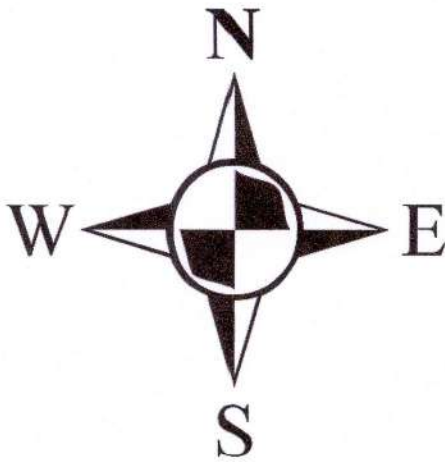
W	- WEIR
C	- CASCADE
DB	- DAMBOARD
SE	- SIDE ENTRY
FV	- FLAP VALVE
BD	- BACK DROP
S	- SIPHON
HD	- HIGHWAY DRAIN
S104	- SECTION 104
C	- CIRCULAR
E	- EGG SHAPED
O	- OTHER
R	- RECTANGLE
S	- SQUARE
T	- TRAPEZOIDAL
U	- UNKNOWN

TABULAR KEY

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B. Where the node bifurcates (splits) X and Y indicates downstream sewer pipe.
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PURPOSE

C	- COMBINED
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SEWER RECORD (TABULAR)

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Sheet No. 1 of 1

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SK4003NW

SK3903SE

SK4003SE

SK4002NW

- ✕✕✕✕ Abandoned Sewer

— Private Combined Gravity Sewer

— Private Foul Gravity Sewer

— Private Surface Water Gravity Sewer

— Public Combined Gravity Sewer

— Public Foul Gravity Sewer

— Public Surface Water Gravity Sewer

— Trunk Combined Gravity Sewer

— Trunk Foul Use Gravity Sewer

— Trunk Surface Water Gravity Sewer

— Combined Use Pressurised Sewer

— Foul Use Pressurised Sewer

— Surface Water Pressurised Sewer

— Highway Drain

— Combined Lateral Drain (SS)

— Foul Lateral Drain (SS)

— Surface Water Lateral Drain (SS)

— Cable, Earthing

— Cable Junction

— Cable, Optical Fibre/Instrumentation

— Cable, Low Voltage

— Cable, High Voltage

— Cable, Other

[B] Housing, Building

[K] Housing, Kiosk

[L] Disposal Site

[STW] Sewage Treatment Works

[H] Housing, Other

— Pipe Support Structure

— Sewage Pumping Facility

[X] Sewer Facility Connection Inlet / Outlet

■ Blind Shaft

● Combined Use Manhole

□ Flushing Chamber

● Foul Use Manhole

● Grease Trap

• Head Node

— Hydrobrake

□ Lamphole

□ Outfall

□ Overflow

— Penstock

⊕ Petrol Interceptor

★ Sewer Blockage

☆ Sewer Collapse

— Sewer Chemical Injection Point

▪ Sewer Junction

◆ Sewerage Air Valve

|| Sewerage Hatch Box Point

— Sewerage Isolation Valve

⊕ Soakaway

○ Surface Water Manhole

■ Vent Column

■ Waste Water Storage

— Culverted Watercourse

— Pre-1937 Properties

Sewer Node		Sewer Pipe Data									
REFERENCE	COVER LEVEL	R/W LEVEL UPSTR	R/W LEVEL DOWNSTR	PURP	MATL	SHAPE	MAX SIZE	MIN SIZE	GRADIENT	YEAR LAID	
SK4003001	123.70	nil	nil	S	VC	C	300	nil	0.00	nil	
SK40030101	121.92	120.07	116.76	F	VC	C	175	nil	43.44	nil	
SK40031001	124.91	122.98	121.83	S	VC	C	nil	nil	46.86	nil	
SK40031002	124.86	123.18	123.55	S	VC	C	nil	nil	125.23	nil	
SK40031003	125.38	124.44	123.76	F	VC	C	nil	nil	102.53	nil	
SK40031101	123.83	121.70	120.98	F	VC	C	175	nil	30.75	nil	
SK40031102	125.79	123.89	nil	F	VC	C	nil	nil	0.00	nil	
SK40031103	nil	nil	121.71	F	VC	C	nil	nil	0.00	nil	
SK40031104	125.04	124.26	123.26	S	VC	C	nil	nil	92.78	nil	
SK40032001	127.07	125.80	125.11	S	VC	C	150	nil	98.49	nil	
SK40032002	127.16	125.76	nil	S	VC	C	150	nil	0.00	nil	
SK40032003	127.28	125.78	nil	F	VC	C	nil	nil	0.00	nil	
SK40032004	127.38	125.96	125.80	F	VC	C	150	nil	95.19	nil	
SK40032005	127.51	126.28	125.80	S	VC	C	150	nil	31.31	nil	
SK40032006	127.80	126.52	126.29	S	VC	C	150	nil	81.22	nil	
SK40032007	127.91	126.52	126.00	F	VC	C	150	nil	58.48	nil	
SK40032008	128.40	127.22	126.54	F	VC	C	150	nil	39.81	nil	
SK40032009	128.39	126.94	126.53	S	VC	C	150	nil	83.46	nil	
SK40032010	127.12	126.24	nil	S	VC	C	150	nil	0.00	nil	
SK40032011	127.01	125.72	nil	F	VC	C	nil	nil	0.00	nil	
SK40032401	109.03	107.13	106.72	C	VC	C	300	nil	77.39	nil	
SK40032402	109.40	107.92	107.28	C	VC	C	150	nil	51.94	nil	
SK40033001	129.08	127.24	123.75	F	VC	C	nil	nil	45.07	nil	
SK40033002	129.10	127.43	126.33	F	VC	C	150	nil	75.55	nil	
SK40033101	125.14	124.42	125.20	F	VC	C	150	nil	0.00	nil	
SK40033102	123.71	123.31	123.29	F	VC	C	nil	nil	2384.00	nil	
SK40033103	123.84	122.84	122.70	S	VC	C	150	nil	185.86	nil	
SK40033104	126.92	125.18	123.33	F	VC	C	150	nil	1.21	nil	
SK40033105	123.73	122.66	122.55	S	VC	C	150	nil	192.82	nil	
SK40033202	115.07	113.08	110.11	F	VC	C	225	nil	41.02	nil	
SK40033203	114.96	113.70	112.35	S	VC	C	300	nil	4.19	nil	
SK40033301	111.72	110.11	107.15	F	VC	C	300	nil	31.30	nil	
SK40033401	110.39	nil	107.93	C	VC	C	150	nil	0.00	nil	
SK40034001	128.61	126.30	123.71	F	VC	C	150	nil	11.59	nil	
SK40034002	128.36	126.99	nil	S	VC	C	300	nil	0.00	nil	
SK40034003	129.43	127.41	126.31	F	VC	C	150	nil	32.84	nil	
SK40034004	128.61	127.15	126.35	F	VC	C	150	nil	63.10	nil	
SK40034005	128.73	127.39	nil	S	VC	C	225	nil	0.00	nil	
SK40034006	130.71	129.07	128.14	F	VC	C	150	nil	70.94	nil	
SK40034007	129.75	128.03	nil	S	VC	C	225	nil	0.00	nil	
SK40034101	124.05	123.68	122.87	F	VC	C	nil	nil	98.06	nil	
SK40034103	123.98	123.28	122.92	F	VC	C	nil	nil	69.44	nil	
SK40034104	124.16	122.83	122.57	F	VC	C	nil	nil	50.15	nil	
SK40034105	123.75	122.15	121.67	F	VC	C	nil	nil	48.65	nil	
SK40034108	123.81	121.30	113.81	S	VC	C	300	nil	14.30	nil	
SK40034109	123.92	122.32	nil	S	VC	C	150	nil	0.00	nil	
SK40034110	123.83	122.53	122.34	S	VC	C	150	nil	121.53	nil	
SK40034201	123.18	121.58	120.01	F	VC	C	nil	nil	15.62	nil	
SK40034202	121.39	119.98	115.98	F	VC	C	nil	nil	14.14	nil	
SK40034203	117.35	114.88	113.17	F	VC	C	150	nil	28.21	nil	

SEVERN
TRENT
WATER

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SEWER RECORD (TABULAR)

O/S Map scale: 1:1250

Date of issue: 01.11.16

Sheet No. 1 of 1

This map is centred upon:

O / S Tile reference:

SK4003SW

Disclaimer Statement:

1. Do not scale off this Map.
2. This map and any information supplied with it is furnished as a general guide, is only valid at the date of issue and no warranty as to its correctness is given or implied. In particular this Map and any information shown on it must not be relied upon in the event of any development or works (including but not limited to excavations) in the vicinity of Severn Trent Water's assets or for the purposes of determining the suitability of a point of connection to the sewerage or distribution systems.
3. On 1 October 2011 most private sewers and private lateral drains in Severn Trent Water's sewerage area, which were connected to a public sewer as at 1 July 2011, transferred to the ownership of Severn Trent Water and became public sewers and public lateral drains. A further transfer takes place on 1 October 2012 (date to be confirmed). Private pumping stations, which form part of these sewers or lateral drains, will transfer to the ownership of Severn Trent Water on or before 1 October 2016. Severn Trent Water does not possess complete records of these assets. These assets may not be displayed on this Map.
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Appendix D SuDS Feature Maintenance Schedules

Drainage Maintenance Schedule

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Kyns Golf Course, Market Bosworth, Coventry

Schedule	Feature	Required Action	Frequency
Regular Maintenance	Rainwater Harvesting	Inspection of the Tank for Debris and Sediment Build-Up, Inlets/ Outlets/ Withdrawal Devices, Overflow Areas, Pumps and Filters.	Annually (and following poor performance)
		Cleaning of Tank, Inlets, Outlets, Gutters, Withdrawal Devices and Roof Drain Filters of Silts and other Debris.	Annually (and following poor performance).
	Green Roofs	Remove Debris and Litter to Prevent Clogging of Inlet Drains and Interference with Plant Growth.	Six Monthly and Annually or as required
		During Establishment (i.e. year one), Replace Dead Plants as required.	Monthly (but usually responsibility of manufacturer)
		Post Establishment, Replace Dead Plants as Required (where >5% of coverage).	Annually (In autumn)
		Remove Fallen Leaves and Debris from Deciduous Plant Foliage.	Six Monthly or as required
		Remove Nuisance and Invasive Vegetation, Including Weeds.	Six Monthly or as required
		Mow Grasses, Prune Shrubs and Manage Other Planting (if appropriate) as Required – Clippings Should be Removed and not Allowed to Accumulate.	Six Monthly or as required
	Infiltration Systems	Remove Litter, Debris and Trash.	Monthly
		Cut Grass – for Landscaped Areas and Access Routes.	Monthly (during growing season) or as required
		Cut Grass – Meadow Grass in and Around Basin.	Half yearly: spring (before nesting season) and autumn
		Manage Other Vegetation and Remove Nuisance Plants.	Monthly at start, then as required
	Filter Strips	Remove Litter and Debris.	Monthly (or as required)
		Cut Grass – To Retain Grass Height Within Specified Design Range.	Monthly (during growing season), or as required
		Manage Other Vegetation and Remove Nuisance Plants.	Monthly (at start, then as required)
	Filter Drains	Remove Litter (inc leaf litter) and Debris from Filter Drain Surface, Access Chambers and Pre-Treatment Devices.	Monthly (or as required)
		Inspect Filter Drain Surface, Inlet/ Outlet Pipework and Control Systems for Blockages, Clogging, Standing Water and Structural Damage.	Monthly

Drainage Maintenance Schedule

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Kyns Golf Course, Market Bosworth, Coventry

		Inspect Pre-Treatment Systems, Inlets and Perforated Pipework for Silt Accumulation, and Establish Appropriate Silt Removal Frequencies.	Six monthly
		Remove Sediment from Pre-Treatment Devices.	Six monthly, or as required
	Swales	Remove Litter and Debris	Monthly, or as required
		Cut Grass – to Retain Grass Height Within Specified Design Range.	Monthly (during growing season), or as required
		Manage Other Vegetation and Remove Nuisance Plants.	Monthly at start, then as required
		Inspect Inlets, Outlets and Overflows for Blockages, and Clear if Required.	Monthly
		Inspect Infiltration Surfaces for Ponding, Compaction, Silt Accumulation, Record Areas Where Water is Ponding for > 48 Hours.	Monthly, or when required
		Inspect Vegetation Coverage.	Monthly for 6 months, quarterly for 2 years, then half yearly
		Inspect Inlets and Facility Surface for Silt Accumulation, Establish Appropriate Silt Removal Frequencies.	Half yearly
	Bioretention	Remove Litter and Surface Debris and Weeds.	Quarterly (or more frequently for tidiness or aesthetic reasons)
		Replace any Plants, to Maintain Planting Density.	As required
		Remove Sediment, Litter and Debris Build-Up from Around Inlets or from Forebays.	Quarterly to biannually
	Trees	Remove Litter and Debris.	Monthly (or as required)
		Manage Other Vegetation and Remove Nuisance Plants.	Monthly (at start, then as required)
		Inspect Inlets and Outlets.	Inspect monthly
	Permeable Pavements	Brushing and Vacuuming (standard cosmetic sweep over whole surface).	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturers recommendations – pay attention to areas

Drainage Maintenance Schedule

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Kyns Golf Course, Market Bosworth, Coventry

			where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
	Attenuation Storage Tanks	Inspect and Identify any Areas that are not Operating Correctly. If Required, take Remedial Action.	Monthly for 3 months, then Annually
		Remove Debris from the Catchment Surface (where it may cause risks to performance).	Monthly
		For Systems Where Rainfall Infiltrates into the Tank from Above, Check Surface of Filter for Blockage by Sediment, Algae or Other Matter; Remove and Replace Surface Infiltration Medium as Necessary.	Annually
	Detention Basins	Remove Litter and Debris.	Monthly
		Cut Grass – for Spillways and Access Routes.	Monthly (during growing season), or as required
		Cut Grass – Meadow Grass in and Around Basin.	Half yearly (spring – before nesting season, and autumn)
		Manage Other Vegetation and Remove Nuisance Plants.	Monthly (at start, then as required)
		Inspect Outlets, Inlets and Overflows for Blockages and Clear if Required.	Monthly
		Inspect Banksides, Structures, Pipework etc for Evidence of Physical Damage.	Monthly
		Inspect Inlets and Facility Surface for Silt Accumulation. Establish Appropriate Silt Removal Frequencies.	Monthly (for first year), then annually or as required
		Check any Penstocks and Other Mechanical Devices.	Annually
		Tidy All Dead Growth Before Start of Growing Season.	Annually
		Remove Sediment from Inlets, Outlets and Forebay.	Annually (or as required)
		Manage Wetland Plants in Outlet Pool – Where Provided.	Annually
	Ponds and Wetlands	Remove Litter and Debris.	Monthly (or as required)
		Cut the Grass – Public Areas.	Monthly (during growing season)

Drainage Maintenance Schedule

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Kyns Golf Course, Market Bosworth, Coventry

		Cut the Meadow Grass.	Half yearly (spring, before nesting season, and autumn)
		Inspect Marginal and Bankside Vegetation and Remove Nuisance Plants (for First 3 Years).	Monthly (at start then as required)
		Inspect Inlets, Outlets, Banksides, Structures, Pipework etc for Evidence of Blockage and/ or Physical Damage.	Monthly
		Inspect Water Body for Signs of Poor Water Quality.	Monthly (May – October)
		Inspect Silt Accumulation Rates un any Forebay and in Main Body of the Pond and Establish Appropriate Removal Frequencies; Undertake Contamination Testing Once Some Build-Up Has Occurred, to Inform Management and Disposal Options.	Half yearly
		Check Any Mechanical Devices, e.g. Penstocks.	Half yearly
		Hand Cut Submerged and Emergent Aquatic Plants (at minimum of 1.0m above pond base; include max 25% of pond surface).	Annually
		Remove 25% of Bank Vegetation from Waters Edge to a Minimum of 1m Above Water Level.	Annually
		Tidy All Dead Growth (scrub clearance) Before Start of Growing Season (note: tree maintenance is usually part of overall landscape management contract).	Annually
		Remove Sediment and Planting from one Quadrant of the Main Body of Ponds Without Sediment Forebays.	Every 1 -5 years, or as required
		Remove Sediment from any Forebay.	Annually

Schedule	Feature	Required Action	Frequency
Occasional Maintenance	Rainwater Harvesting	Cleaning and/or replacement of any Filters.	Three monthly (or as required)
	Infiltration Systems	Reseed Areas of Poor Vegetation Growth.	Annually or as required
		Prune and Trim Trees and Remove Cuttings.	As required
		Remove Sediment from Pre-Treatment System when 50% Full.	As required



Drainage Maintenance Schedule

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Kyns Golf Course, Market Bosworth, Coventry

	Filter Strips	Reseed Areas of Poor Vegetation Growth; Alter Plant Types to Better Suit Conditions, if required.	As required or if bare soil is exposed over
	Filter Drains	Remove or Control Tree Roots Where They are Encroaching the Sides of the Filter Drain, Using Recommended Methods (e.g. NJUG, 2007 or BS 3998:2010).	As required
		At Locations with High Pollution Loads, Remove Surface Geotextile and Replace, and Wash or Replace Overlaying Filter Medium.	Five yearly, or as required
		Clear Perforated Pipework of Blockages.	As required
	Bioretention	Infill any Holes or Scour in the Filter Medium, Improve Erosion Protection if Required.	As required
		Repair Minor Accumulations of Silt by Raking Away Surface Mulch, Scarifying Surface of Medium and Replacing Mulch.	As required
	Trees	Check Tree Health and Manage Tree Appropriately.	Annually
		Remove Silt Build-Up from Inlets and Surface and Replace Mulch as Necessary.	Annually, or as required
		Water	As required
	Permeable Pavements	Stabilise and Mow Contributing and Adjacent Areas.	As required
		Removal of Weeds or Management Using Glyphosate Applied Directly into the Weeds by an Application Rather Than Spraying.	As required – once per year on less frequently used pavements
	Detention Basins	Reseed Areas if Poor Vegetation Growth.	As required
		Prune and Trim any Trees and Remove Cuttings.	Every 2 years, or as required
		Remove Sediment from Inlets, Outlets, Forebay and Main Bain when Required.	Every 5 years, or as required (likely to be minimal requirements where effective upstream source control is provided).
	Ponds and Wetlands	Remove Sediment from the Main Body of Big Ponds when Pool Volume is Reduced by 20%.	With effective pre-treatment, this will only be required rarely, e.g. every 25-50 years

Drainage Maintenance Schedule

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Kyns Golf Course, Market Bosworth, Coventry

Schedule	Feature	Required Action	Frequency
Routine Maintenance	Proprietary Treatment System	Remove Litter and Debris and Inspect for Sediment, Oil and Grease Accumulation.	Six Monthly
		Change the Filter Media.	As recommended by manufacturer
		Remove Sediment, Oil, Grease and Floatables.	As necessary – indicated by system inspections or immediately following significant spill

Schedule	Feature	Required Action	Frequency
Remedial Actions	Rainwater Harvesting	Repair of Overflow Erosion Damage or Damage to Tank.	As required
		Pump Repairs.	As required
	Green Roofs	If Erosion Channels are Evident, These Should be Stabilised with Extra Soil Substrate Similar to the Original Material, and Sources of Erosion Damage Should be Identified and Controlled.	As required
		If Drain Inlet Has Settled, Cracked or Moved Investigate and Repair as Appropriate.	As required
	Infiltration Systems	Repair Erosion or other Damage by Reseeding or Re-Turfing.	As required
		Realign the Rip-Rap.	As required
		Repair or Rehabilitate Inlets, Outlets and Overflows.	As required
		Rehabilitate Infiltration Surface using Scarifying and Spiking Techniques if Performance Deteriorates.	As required.
		Relevel Uneven Surfaces and Reinstate Design Levels.	As required
	Proprietary Treatment System	Replace Malfunctioning Parts or Structures.	As required
	Filter Strips	Repair Erosion or Other Damage by Re-Turfing or Re-Seeding.	As required
		Relevels Uneven Surfaces and Reinstate Design Levels.	As required
		Scarify and Spike Topsoil to Improve Infiltration Performance, Break Up Silt Deposits and Prevent Compaction of the Soil Surface.	As required
		Remove Build Up of Sediment on Upstream Gravel Trench, Flow Spreader or at Top of Filter Strip.	As required



Drainage Maintenance Schedule

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Kyns Golf Course, Market Bosworth, Coventry

		Remove and Dispose of Oils or Petrol Residues Using Safe Standard Practices.	As required
	Swales	Repair Erosion or Other Damage by Re-Turfing or Reseeding.	As required
		Relevel Uneven Surfaces and Reinstall Design Levels.	As required
		Scarify and Spike Topsoil Layer to Improve Infiltration Performance, Break Up Silt Deposits and Prevent Compaction of the Soil Surface.	As required
		Remove Build-Up of Sediment on Upstream Gravel Trench, Flow Spreader or at Top of Filter Strip.	As required
		Remove and Dispose of Oils or Petrol Residues Using Safe Standard Practices.	As required
	Bioretention	Remove and Replace Filter Medium and Vegetation Above.	As required but likely to be > 20 years
	Permeable Pavements	Remediate Any Landscaping which, Through Vegetation Maintenance or Soil Slip, has been Raised to within 50mm of the Level of the Paving.	As required
		Remedial Work to any Depressions, Rutting and Cracked or Broken Blocks Considered Detrimental to the Structural Performance or a Hazard to Users, and Replace Lost Jointing Material.	As required
		Rehabilitation of Surface and Upper Substructure by Remedial Sweeping.	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
	Attenuation Storage Tanks	Repair/ Rehabilitate Inlets, Outlets, Overflows and Vents.	As required
	Detention Basins	Repair Erosion or Other Damage by Reseeding or Re-Turfing.	As required
		Realignment of Rip-Rap.	As required
		Repair/ Rehabilitation of Inlets, Outlets and Overflows.	As required
		Relevel Uneven Surfaces and Reinstall Design Levels.	As required
	Ponds and Wetlands	Repair Erosion or Other Damage.	As required
		Replant, where necessary.	As required
		Aerate Pond When Signs of Eutrophication are Detected.	As required
		Realign Rip-Rap or Repair Other Damage.	As required
		Repair / Rehabilitate Inlets, Outlets and Overflows.	As required

Drainage Maintenance Schedule

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Kyns Golf Course, Market Bosworth, Coventry

Schedule	Feature	Required Action	Frequency
Regular Inspections	Green Roofs	Inspect all components including soil Substrate, Vegetation, Drains, Irrigation Systems, Membranes and Roof Structure for Proper Operation, Integrity of Waterproofing and Structural Stability.	Annually and after severe storms
		Inspect Soil Substrate for Evidence of Erosion Channels and Identify any Sediment Sources.	Annually and after severe storms
		Inspect Drain Inlets to Ensure Un-Restricted Run-off from the Drainage Layer to the Conveyance or Roof Drain System.	Annually and after severe storms
		Inspect Underside of Roof for Evidence of Leakage.	Annually and after severe storms
	Bioretention	Inspect Infiltration Surfaces for Silting and Ponding, Record De-Watering Time of the Facility and Assess Standing Water Levels in Underdrain (if appropriate) to Determine if Maintenance is Necessary.	Quarterly
		Check Operation of Underdrains by Inspection of Flows After Rain.	Annually
		Assess Plants for Disease Infection, Poor Growth, Invasive Species etc and Replace as Necessary.	Quarterly
		Inspect Inlets and Outlets for Blockages.	Quarterly

Schedule	Feature	Required Action	Frequency
Monitoring	Infiltration Systems	Inspect Inlets, Outlets and Overflows for Blockages and Clear if Required.	Monthly
		Inspect Banksides, Structures, Pipework, etc for Evidence of Physical Damage.	Monthly
		Inspect Inlets and Pre-Treatment Systems for Silt Accumulation; Establish Appropriate Silt Removal Frequencies.	Half Yearly
		Inspect Infiltration Surfaces for Compaction and Ponding.	Monthly
	Proprietary Treatment System	Inspect for Evidence of Poor Operation.	Six monthly
	Attenuation Storage Tanks	Survey Inside of Tank for Sediment Build-Up and Remove if Necessary.	Every 5 years or as required
		Inspect/ Check all Inlets, Outlets, Vents and Overflows to Ensure that they are in Good Condition and Operating as Designed.	Annually

Drainage Maintenance Schedule

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Kyns Golf Course, Market Bosworth, Coventry

	Filter Strips	Inspect Silt Accumulation Rates and Establish Appropriate Removal Frequencies.	Half yearly
	Permeable Pavements	Initial Inspection.	Monthly for three months after installation
		Inspect for Evidence of Poor Operation and/or Weed Growth – if required, take Remedial Action.	Three-monthly, 48 hours after large storms in first six months
		Inspect Silt Accumulation Rates and Establish Appropriate Brushing Frequencies.	Annually
		Monitor Inspection Chambers.	Annually

Appendix E Greenfield Runoff Surface Water Calculations

Calculated by:

Site name:

Site location:

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

Site Details

Latitude:

Longitude:

Reference:

Date:

Runoff estimation approach

Site characteristics

Total site area (ha):

Methodology

Q_{BAR} estimation method:

SPR estimation method:

Soil characteristics

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

Hydrological characteristics

	Default	Edited
SAAR (mm):	637	637
Hydrological region:	4	4
Growth curve factor 1 year:	0.83	0.83
Growth curve factor 30 years:	2	2
Growth curve factor 100 years:	2.57	2.57
Growth curve factor 200 years:	3.04	3.04

Notes

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

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

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

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

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

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

Greenfield runoff rates

	Default	Edited
Q_{BAR} (l/s):	11.81	11.81
1 in 1 year (l/s):	9.8	9.8
1 in 30 years (l/s):	23.62	23.62
1 in 100 year (l/s):	30.36	30.36
1 in 200 years (l/s):	35.91	35.91

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

Appendix F Proposed Surface Water Attenuation Calculations

FW1219 - Kyngs Golf Course SUDS Storage Calculations

Global Variables

Location	= England and Wales
SAAR	= 652 mm/yr
WRAP	= 4
M5-60	= 20.00 mm
r Ratio	= 0.40
Soil index	= 0.45

Input Data

Contributing area	= 0.721 ha
Allowable discharge	= 5 lps
Maximum possible storm duration	= 1440 min
Storm duration time step	= 1 min
Storm return period	= 100 years

Calculated Data

Time to max. storage	= 295 mins
Rainfall at max. storage	= 12.2 mm/hr
Storage volume	= 321.757 m ³

Adjustments to Result for Climate Change

Volume + 10% for normal discharge (W5-074)	: Storage volume = 353.932 m ³
Volume + 20% for discharge into river flows (DEFRA)	: Storage volume = 386.108 m ³
Volume + 30% for EA residential requirements	: Storage volume = 418.284 m ³
Volume + 40% for other residential requirements	: Storage volume = 450.453 m³

Output Data

Time	Rainfall	Inflow	Outflow	Balance
Intensity				
mins	mm/hr	m ³	m ³	m ³

1.0	240.96	27.507	0.300	27.207
2.0	213.73	48.799	0.600	48.199
3.0	193.19	66.164	0.900	65.264
4.0	177.03	80.838	1.200	79.638
5.0	163.91	93.561	1.500	92.061
6.0	153.02	104.808	1.800	103.008
7.0	143.79	114.902	2.100	112.802
8.0	135.86	124.073	2.400	121.673
9.0	128.88	132.411	2.700	129.711
10.0	122.40	139.729	3.000	136.729
11.0	116.63	146.458	3.300	143.158
12.0	111.46	152.686	3.600	149.086
13.0	106.79	158.479	3.900	154.579
14.0	102.55	163.895	4.200	159.695
15.0	98.68	168.979	4.500	164.479
16.0	95.14	173.769	4.800	168.969
17.0	91.87	178.297	5.100	173.197
18.0	88.86	182.591	5.400	177.191
19.0	86.06	186.673	5.700	180.973
20.0	83.46	190.564	6.000	184.564
21.0	81.04	194.281	6.300	187.981
22.0	78.77	197.839	6.600	191.239
23.0	76.65	201.251	6.900	194.351
24.0	74.65	204.529	7.200	197.329
25.0	72.77	207.684	7.500	200.184
26.0	71.00	210.723	7.800	202.923
27.0	69.32	213.656	8.100	205.556
28.0	67.73	216.490	8.400	208.090
29.0	66.22	219.232	8.700	210.532
30.0	64.79	221.887	9.000	212.887

31.0	63.43	224.461	9.300	215.161
32.0	62.13	226.958	9.600	217.358
33.0	60.89	229.384	9.900	219.484
34.0	59.71	231.743	10.200	221.543
35.0	58.57	234.037	10.500	223.537
36.0	57.49	236.271	10.800	225.471
37.0	56.45	238.448	11.100	227.348
38.0	55.46	240.570	11.400	229.170
39.0	54.50	242.641	11.700	230.941
40.0	53.58	244.663	12.000	232.663
41.0	52.69	246.638	12.300	234.338
42.0	51.84	248.568	12.600	235.968
43.0	51.02	250.455	12.900	237.555
44.0	50.23	252.302	13.200	239.102
45.0	49.47	254.110	13.500	240.610
46.0	48.73	255.881	13.800	242.081
47.0	48.01	257.616	14.100	243.516
48.0	47.32	259.316	14.400	244.916
49.0	46.66	260.984	14.700	246.284
50.0	46.01	262.620	15.000	247.620
51.0	45.38	264.225	15.300	248.925
52.0	44.78	265.801	15.600	250.201
53.0	44.19	267.349	15.900	251.449
54.0	43.62	268.870	16.200	252.670
55.0	43.06	270.364	16.500	253.864
56.0	42.52	271.832	16.800	255.032
57.0	42.00	273.277	17.100	256.177
58.0	41.49	274.697	17.400	257.297
59.0	40.99	276.095	17.700	258.395
60.0	40.51	277.470	18.000	259.470
61.0	40.04	278.824	18.300	260.524
62.0	39.58	280.157	18.600	261.557
63.0	39.14	281.470	18.900	262.570
64.0	38.70	282.763	19.200	263.563
65.0	38.28	284.037	19.500	264.537
66.0	37.87	285.293	19.800	265.493
67.0	37.46	286.531	20.100	266.431
68.0	37.07	287.751	20.400	267.351
69.0	36.68	288.955	20.700	268.255

70.0	36.31	290.142	21.000	269.142
71.0	35.94	291.313	21.300	270.013
72.0	35.58	292.468	21.600	270.868
73.0	35.23	293.609	21.900	271.709
74.0	34.89	294.734	22.200	272.534
75.0	34.55	295.845	22.500	273.345
76.0	34.23	296.942	22.800	274.142
77.0	33.90	298.025	23.100	274.925
78.0	33.59	299.095	23.400	275.695
79.0	33.28	300.152	23.700	276.452
80.0	32.98	301.197	24.000	277.197
81.0	32.68	302.228	24.300	277.928
82.0	32.39	303.248	24.600	278.648
83.0	32.11	304.256	24.900	279.356
84.0	31.83	305.252	25.200	280.052
85.0	31.56	306.237	25.500	280.737
86.0	31.29	307.211	25.800	281.411
87.0	31.03	308.174	26.100	282.074
88.0	30.77	309.126	26.400	282.726
89.0	30.52	310.068	26.700	283.368
90.0	30.27	311.000	27.000	284.000
91.0	30.03	311.922	27.300	284.622
92.0	29.79	312.834	27.600	285.234
93.0	29.55	313.737	27.900	285.837
94.0	29.32	314.630	28.200	286.430
95.0	29.09	315.514	28.500	287.014
96.0	28.87	316.390	28.800	287.590
97.0	28.65	317.256	29.100	288.156
98.0	28.43	318.114	29.400	288.714
99.0	28.22	318.963	29.700	289.263
100.0	28.01	319.804	30.000	289.804
101.0	27.81	320.637	30.300	290.337
102.0	27.61	321.462	30.600	290.862
103.0	27.41	322.279	30.900	291.379
104.0	27.21	323.089	31.200	291.889
105.0	27.02	323.891	31.500	292.391
106.0	26.83	324.685	31.800	292.885
107.0	26.65	325.472	32.100	293.372
108.0	26.46	326.252	32.400	293.852

109.0	26.28	327.025	32.700	294.325
110.0	26.10	327.791	33.000	294.791
111.0	25.93	328.551	33.300	295.251
112.0	25.76	329.303	33.600	295.703
113.0	25.59	330.049	33.900	296.149
114.0	25.42	330.789	34.200	296.589
115.0	25.25	331.522	34.500	297.022
116.0	25.09	332.249	34.800	297.449
117.0	24.93	332.970	35.100	297.870
118.0	24.77	333.685	35.400	298.285
119.0	24.62	334.393	35.700	298.693
120.0	24.46	335.096	36.000	299.096
121.0	24.31	335.793	36.300	299.493
122.0	24.16	336.485	36.600	299.885
123.0	24.01	337.171	36.900	300.271
124.0	23.87	337.851	37.200	300.651
125.0	23.72	338.526	37.500	301.026
126.0	23.58	339.196	37.800	301.396
127.0	23.44	339.860	38.100	301.760
128.0	23.30	340.519	38.400	302.119
129.0	23.17	341.173	38.700	302.473
130.0	23.03	341.823	39.000	302.823
131.0	22.90	342.467	39.300	303.167
132.0	22.77	343.106	39.600	303.506
133.0	22.64	343.740	39.900	303.840
134.0	22.51	344.370	40.200	304.170
135.0	22.39	344.995	40.500	304.495
136.0	22.26	345.615	40.800	304.815
137.0	22.14	346.231	41.100	305.131
138.0	22.02	346.842	41.400	305.442
139.0	21.90	347.449	41.700	305.749
140.0	21.78	348.051	42.000	306.051
141.0	21.66	348.649	42.300	306.349
142.0	21.54	349.243	42.600	306.643
143.0	21.43	349.833	42.900	306.933
144.0	21.32	350.419	43.200	307.219
145.0	21.20	351.000	43.500	307.500
146.0	21.09	351.577	43.800	307.777
147.0	20.98	352.151	44.100	308.051

148.0	20.88	352.720	44.400	308.320
149.0	20.77	353.286	44.700	308.586
150.0	20.66	353.848	45.000	308.848
151.0	20.56	354.406	45.300	309.106
152.0	20.46	354.960	45.600	309.360
153.0	20.35	355.510	45.900	309.610
154.0	20.25	356.057	46.200	309.857
155.0	20.15	356.600	46.500	310.100
156.0	20.05	357.140	46.800	310.340
157.0	19.96	357.676	47.100	310.576
158.0	19.86	358.209	47.400	310.809
159.0	19.76	358.738	47.700	311.038
160.0	19.67	359.264	48.000	311.264
161.0	19.58	359.786	48.300	311.486
162.0	19.48	360.306	48.600	311.706
163.0	19.39	360.821	48.900	311.921
164.0	19.30	361.334	49.200	312.134
165.0	19.21	361.843	49.500	312.343
166.0	19.12	362.350	49.800	312.550
167.0	19.03	362.853	50.100	312.753
168.0	18.95	363.353	50.400	312.953
169.0	18.86	363.850	50.700	313.150
170.0	18.77	364.344	51.000	313.344
171.0	18.69	364.835	51.300	313.535
172.0	18.61	365.323	51.600	313.723
173.0	18.52	365.808	51.900	313.908
174.0	18.44	366.290	52.200	314.090
175.0	18.36	366.769	52.500	314.269
176.0	18.28	367.246	52.800	314.446
177.0	18.20	367.719	53.100	314.619
178.0	18.12	368.190	53.400	314.790
179.0	18.04	368.658	53.700	314.958
180.0	17.96	369.123	54.000	315.123
181.0	17.89	369.586	54.300	315.286
182.0	17.81	370.046	54.600	315.446
183.0	17.74	370.503	54.900	315.603
184.0	17.66	370.958	55.200	315.758
185.0	17.59	371.410	55.500	315.910
186.0	17.51	371.860	55.800	316.060

187.0	17.44	372.307	56.100	316.207
188.0	17.37	372.752	56.400	316.352
189.0	17.30	373.194	56.700	316.494
190.0	17.23	373.633	57.000	316.633
191.0	17.16	374.071	57.300	316.771
192.0	17.09	374.505	57.600	316.905
193.0	17.02	374.938	57.900	317.038
194.0	16.95	375.368	58.200	317.168
195.0	16.88	375.796	58.500	317.296
196.0	16.81	376.221	58.800	317.421
197.0	16.75	376.644	59.100	317.544
198.0	16.68	377.065	59.400	317.665
199.0	16.62	377.483	59.700	317.783
200.0	16.55	377.900	60.000	317.900
201.0	16.49	378.314	60.300	318.014
202.0	16.42	378.726	60.600	318.126
203.0	16.36	379.136	60.900	318.236
204.0	16.30	379.543	61.200	318.343
205.0	16.24	379.949	61.500	318.449
206.0	16.17	380.352	61.800	318.552
207.0	16.11	380.753	62.100	318.653
208.0	16.05	381.152	62.400	318.752
209.0	15.99	381.550	62.700	318.850
210.0	15.93	381.945	63.000	318.945
211.0	15.87	382.338	63.300	319.038
212.0	15.81	382.729	63.600	319.129
213.0	15.76	383.118	63.900	319.218
214.0	15.70	383.505	64.200	319.305
215.0	15.64	383.890	64.500	319.390
216.0	15.58	384.274	64.800	319.474
217.0	15.53	384.655	65.100	319.555
218.0	15.47	385.035	65.400	319.635
219.0	15.42	385.412	65.700	319.712
220.0	15.36	385.788	66.000	319.788
221.0	15.31	386.162	66.300	319.862
222.0	15.25	386.534	66.600	319.934
223.0	15.20	386.904	66.900	320.004
224.0	15.14	387.272	67.200	320.072
225.0	15.09	387.639	67.500	320.139

226.0	15.04	388.004	67.800	320.204
227.0	14.99	388.367	68.100	320.267
228.0	14.93	388.728	68.400	320.328
229.0	14.88	389.088	68.700	320.388
230.0	14.83	389.446	69.000	320.446
231.0	14.78	389.802	69.300	320.502
232.0	14.73	390.157	69.600	320.557
233.0	14.68	390.510	69.900	320.610
234.0	14.63	390.861	70.200	320.661
235.0	14.58	391.210	70.500	320.710
236.0	14.53	391.558	70.800	320.758
237.0	14.49	391.905	71.100	320.805
238.0	14.44	392.249	71.400	320.849
239.0	14.39	392.592	71.700	320.892
240.0	14.34	392.934	72.000	320.934
241.0	14.29	393.274	72.300	320.974
242.0	14.25	393.612	72.600	321.012
243.0	14.20	393.949	72.900	321.049
244.0	14.16	394.284	73.200	321.084
245.0	14.11	394.618	73.500	321.118
246.0	14.06	394.951	73.800	321.151
247.0	14.02	395.281	74.100	321.181
248.0	13.97	395.611	74.400	321.211
249.0	13.93	395.938	74.700	321.238
250.0	13.88	396.265	75.000	321.265
251.0	13.84	396.590	75.300	321.290
252.0	13.80	396.913	75.600	321.313
253.0	13.75	397.235	75.900	321.335
254.0	13.71	397.556	76.200	321.356
255.0	13.67	397.875	76.500	321.375
256.0	13.63	398.193	76.800	321.393
257.0	13.58	398.509	77.100	321.409
258.0	13.54	398.824	77.400	321.424
259.0	13.50	399.138	77.700	321.438
260.0	13.46	399.450	78.000	321.450
261.0	13.42	399.761	78.300	321.461
262.0	13.38	400.071	78.600	321.471
263.0	13.34	400.379	78.900	321.479
264.0	13.30	400.686	79.200	321.486

265.0	13.26	400.991	79.500	321.491
266.0	13.22	401.296	79.800	321.496
267.0	13.18	401.599	80.100	321.499
268.0	13.14	401.901	80.400	321.501
269.0	13.10	402.201	80.700	321.501
270.0	13.06	402.500	81.000	321.500
271.0	13.02	402.798	81.300	321.498
272.0	12.98	403.095	81.600	321.495
273.0	12.94	403.390	81.900	321.490
274.0	12.91	403.685	82.200	321.485
275.0	12.87	403.978	82.500	321.478
276.0	12.83	404.269	82.800	321.469
277.0	12.79	404.560	83.100	321.460
278.0	12.76	404.849	83.400	321.449
279.0	12.73	405.339	83.700	321.639
280.0	12.69	405.653	84.000	321.653
281.0	12.66	405.967	84.300	321.667
282.0	12.62	406.279	84.600	321.679
283.0	12.59	406.591	84.900	321.691
284.0	12.55	406.901	85.200	321.701
285.0	12.52	407.211	85.500	321.711
286.0	12.48	407.519	85.800	321.719
287.0	12.45	407.827	86.100	321.727
288.0	12.41	408.134	86.400	321.734
289.0	12.38	408.440	86.700	321.740
290.0	12.35	408.745	87.000	321.745
291.0	12.31	409.049	87.300	321.749
292.0	12.28	409.352	87.600	321.752
293.0	12.25	409.655	87.900	321.755
294.0	12.21	409.956	88.200	321.756
295.0	12.18	410.257	88.500	321.757 Maximum
296.0	12.15	410.556	88.800	321.756
297.0	12.12	410.855	89.100	321.755
298.0	12.09	411.153	89.400	321.753
299.0	12.05	411.450	89.700	321.750
300.0	12.02	411.746	90.000	321.746
301.0	11.99	412.042	90.300	321.742
302.0	11.96	412.336	90.600	321.736
303.0	11.93	412.630	90.900	321.730

304.0	11.90	412.923	91.200	321.723
305.0	11.87	413.215	91.500	321.715
306.0	11.84	413.506	91.800	321.706
307.0	11.81	413.797	92.100	321.697
308.0	11.78	414.086	92.400	321.686
309.0	11.75	414.375	92.700	321.675
310.0	11.72	414.663	93.000	321.663
311.0	11.69	414.950	93.300	321.650
312.0	11.66	415.237	93.600	321.637
313.0	11.63	415.522	93.900	321.622
314.0	11.60	415.807	94.200	321.607
315.0	11.57	416.091	94.500	321.591
316.0	11.54	416.375	94.800	321.575
317.0	11.51	416.657	95.100	321.557
318.0	11.49	416.939	95.400	321.539
319.0	11.46	417.220	95.700	321.520
320.0	11.43	417.500	96.000	321.500
321.0	11.40	417.780	96.300	321.480
322.0	11.37	418.059	96.600	321.459
323.0	11.35	418.337	96.900	321.437
324.0	11.32	418.614	97.200	321.414
325.0	11.29	418.891	97.500	321.391
326.0	11.26	419.166	97.800	321.366
327.0	11.24	419.442	98.100	321.342
328.0	11.21	419.716	98.400	321.316
329.0	11.18	419.990	98.700	321.290
330.0	11.16	420.263	99.000	321.263
331.0	11.13	420.535	99.300	321.235
332.0	11.10	420.806	99.600	321.206
333.0	11.08	421.077	99.900	321.177
334.0	11.05	421.347	100.200	321.147
335.0	11.02	421.617	100.500	321.117
336.0	11.00	421.886	100.800	321.086
337.0	10.97	422.154	101.100	321.054
338.0	10.95	422.421	101.400	321.021
339.0	10.92	422.688	101.700	320.988
340.0	10.90	422.954	102.000	320.954
341.0	10.87	423.219	102.300	320.919
342.0	10.85	423.484	102.600	320.884

343.0	10.82	423.748	102.900	320.848
344.0	10.80	424.012	103.200	320.812
345.0	10.77	424.274	103.500	320.774
346.0	10.75	424.537	103.800	320.737
347.0	10.72	424.798	104.100	320.698
348.0	10.70	425.059	104.400	320.659
349.0	10.68	425.319	104.700	320.619
350.0	10.65	425.579	105.000	320.579
351.0	10.63	425.837	105.300	320.537
352.0	10.60	426.096	105.600	320.496
353.0	10.58	426.353	105.900	320.453
354.0	10.56	426.610	106.200	320.410
355.0	10.53	426.867	106.500	320.367
356.0	10.51	427.123	106.800	320.323
357.0	10.49	427.378	107.100	320.278
358.0	10.46	427.632	107.400	320.232
359.0	10.44	427.886	107.700	320.186
360.0	10.42	428.140	108.000	320.140
361.0	10.40	428.392	108.300	320.092
362.0	10.37	428.645	108.600	320.045
363.0	10.35	428.896	108.900	319.996
364.0	10.33	429.147	109.200	319.947
365.0	10.31	429.397	109.500	319.897
366.0	10.28	429.647	109.800	319.847
367.0	10.26	429.896	110.100	319.796
368.0	10.24	430.145	110.400	319.745
369.0	10.22	430.393	110.700	319.693
370.0	10.20	430.641	111.000	319.641
371.0	10.17	430.888	111.300	319.588
372.0	10.15	431.134	111.600	319.534
373.0	10.13	431.380	111.900	319.480
374.0	10.11	431.625	112.200	319.425
375.0	10.09	431.869	112.500	319.369
376.0	10.07	432.114	112.800	319.314
377.0	10.05	432.357	113.100	319.257
378.0	10.03	432.600	113.400	319.200
379.0	10.00	432.843	113.700	319.143
380.0	9.98	433.084	114.000	319.084
381.0	9.96	433.326	114.300	319.026

382.0	9.94	433.567	114.600	318.967
383.0	9.92	433.807	114.900	318.907
384.0	9.90	434.047	115.200	318.847
385.0	9.88	434.286	115.500	318.786
386.0	9.86	434.524	115.800	318.724
387.0	9.84	434.763	116.100	318.663
388.0	9.82	435.000	116.400	318.600
389.0	9.80	435.237	116.700	318.537
390.0	9.78	435.474	117.000	318.474
391.0	9.76	435.710	117.300	318.410
392.0	9.74	435.945	117.600	318.345
393.0	9.72	436.180	117.900	318.280
394.0	9.70	436.415	118.200	318.215
395.0	9.68	436.649	118.500	318.149
396.0	9.66	436.882	118.800	318.082
397.0	9.64	437.115	119.100	318.015
398.0	9.63	437.348	119.400	317.948
399.0	9.61	437.580	119.700	317.880
400.0	9.59	437.811	120.000	317.811
401.0	9.57	438.042	120.300	317.742
402.0	9.55	438.273	120.600	317.673
403.0	9.53	438.503	120.900	317.603
404.0	9.51	438.732	121.200	317.532
405.0	9.49	438.962	121.500	317.462
406.0	9.48	439.190	121.800	317.390
407.0	9.46	439.418	122.100	317.318
408.0	9.44	439.646	122.400	317.246
409.0	9.42	439.873	122.700	317.173
410.0	9.40	440.100	123.000	317.100
411.0	9.38	440.326	123.300	317.026
412.0	9.37	440.552	123.600	316.952
413.0	9.35	440.777	123.900	316.877
414.0	9.33	441.002	124.200	316.802
415.0	9.31	441.226	124.500	316.726
416.0	9.30	441.450	124.800	316.650
417.0	9.28	441.673	125.100	316.573
418.0	9.26	441.896	125.400	316.496
419.0	9.24	442.119	125.700	316.419
420.0	9.23	442.341	126.000	316.341

421.0	9.21	442.562	126.300	316.262
422.0	9.19	442.783	126.600	316.183
423.0	9.17	443.004	126.900	316.104
424.0	9.16	443.224	127.200	316.024
425.0	9.14	443.444	127.500	315.944
426.0	9.12	443.663	127.800	315.863
427.0	9.11	443.882	128.100	315.782
428.0	9.09	444.101	128.400	315.701
429.0	9.07	444.319	128.700	315.619
430.0	9.06	444.537	129.000	315.537
431.0	9.04	444.754	129.300	315.454
432.0	9.02	444.970	129.600	315.370
433.0	9.01	445.187	129.900	315.287
434.0	8.99	445.403	130.200	315.203
435.0	8.97	445.618	130.500	315.118
436.0	8.96	445.833	130.800	315.033
437.0	8.94	446.048	131.100	314.948
438.0	8.93	446.262	131.400	314.862
439.0	8.91	446.476	131.700	314.776
440.0	8.89	446.689	132.000	314.689
441.0	8.88	446.902	132.300	314.602
442.0	8.86	447.115	132.600	314.515
443.0	8.85	447.327	132.900	314.427
444.0	8.83	447.539	133.200	314.339
445.0	8.81	447.750	133.500	314.250
446.0	8.80	447.961	133.800	314.161
447.0	8.78	448.171	134.100	314.071
448.0	8.77	448.382	134.400	313.982
449.0	8.75	448.591	134.700	313.891
450.0	8.74	448.801	135.000	313.801
451.0	8.72	449.010	135.300	313.710
452.0	8.71	449.218	135.600	313.618
453.0	8.69	449.426	135.900	313.526
454.0	8.68	449.634	136.200	313.434
455.0	8.66	449.841	136.500	313.341
456.0	8.65	450.048	136.800	313.248
457.0	8.63	450.255	137.100	313.155
458.0	8.62	450.461	137.400	313.061
459.0	8.60	450.667	137.700	312.967

460.0	8.59	450.872	138.000	312.872
461.0	8.57	451.077	138.300	312.777
462.0	8.56	451.282	138.600	312.682
463.0	8.54	451.486	138.900	312.586
464.0	8.53	451.690	139.200	312.490
465.0	8.51	451.894	139.500	312.394
466.0	8.50	452.097	139.800	312.297
467.0	8.48	452.300	140.100	312.200
468.0	8.47	452.502	140.400	312.102
469.0	8.46	452.704	140.700	312.004
470.0	8.44	452.906	141.000	311.906
471.0	8.43	453.107	141.300	311.807
472.0	8.41	453.308	141.600	311.708
473.0	8.40	453.509	141.900	311.609
474.0	8.38	453.709	142.200	311.509
475.0	8.37	453.909	142.500	311.409
476.0	8.36	454.108	142.800	311.308
477.0	8.34	454.308	143.100	311.208
478.0	8.33	454.506	143.400	311.106
479.0	8.32	454.705	143.700	311.005
480.0	8.30	454.903	144.000	310.903
481.0	8.29	455.101	144.300	310.801
482.0	8.27	455.298	144.600	310.698
483.0	8.26	455.495	144.900	310.595
484.0	8.25	455.692	145.200	310.492
485.0	8.23	455.888	145.500	310.388
486.0	8.22	456.084	145.800	310.284
487.0	8.21	456.280	146.100	310.180
488.0	8.19	456.475	146.400	310.075
489.0	8.18	456.670	146.700	309.970
490.0	8.17	456.865	147.000	309.865
491.0	8.15	457.059	147.300	309.759
492.0	8.14	457.253	147.600	309.653
493.0	8.13	457.447	147.900	309.547
494.0	8.12	457.640	148.200	309.440
495.0	8.10	457.833	148.500	309.333
496.0	8.09	458.025	148.800	309.225
497.0	8.08	458.218	149.100	309.118
498.0	8.06	458.410	149.400	309.010

499.0	8.05	458.601	149.700	308.901
500.0	8.04	458.793	150.000	308.793
501.0	8.03	458.984	150.300	308.684
502.0	8.01	459.174	150.600	308.574
503.0	8.00	459.365	150.900	308.465
504.0	7.99	459.555	151.200	308.355
505.0	7.97	459.744	151.500	308.244
506.0	7.96	459.934	151.800	308.134
507.0	7.95	460.123	152.100	308.023
508.0	7.94	460.311	152.400	307.911
509.0	7.93	460.500	152.700	307.800
510.0	7.91	460.688	153.000	307.688
511.0	7.90	460.876	153.300	307.576
512.0	7.89	461.063	153.600	307.463
513.0	7.88	461.250	153.900	307.350
514.0	7.86	461.437	154.200	307.237
515.0	7.85	461.624	154.500	307.124
516.0	7.84	461.810	154.800	307.010
517.0	7.83	461.996	155.100	306.896
518.0	7.82	462.182	155.400	306.782
519.0	7.80	462.367	155.700	306.667
520.0	7.79	462.552	156.000	306.552
521.0	7.78	462.737	156.300	306.437
522.0	7.77	462.921	156.600	306.321
523.0	7.76	463.105	156.900	306.205
524.0	7.74	463.289	157.200	306.089
525.0	7.73	463.472	157.500	305.972
526.0	7.72	463.656	157.800	305.856
527.0	7.71	463.839	158.100	305.739
528.0	7.70	464.021	158.400	305.621
529.0	7.69	464.203	158.700	305.503
530.0	7.68	464.385	159.000	305.385
531.0	7.66	464.567	159.300	305.267
532.0	7.65	464.749	159.600	305.149
533.0	7.64	464.930	159.900	305.030
534.0	7.63	465.111	160.200	304.911
535.0	7.62	465.291	160.500	304.791
536.0	7.61	465.472	160.800	304.672
537.0	7.60	465.652	161.100	304.552

538.0	7.58	465.831	161.400	304.431
539.0	7.57	466.011	161.700	304.311
540.0	7.56	466.190	162.000	304.190
541.0	7.55	466.369	162.300	304.069
542.0	7.54	466.547	162.600	303.947
543.0	7.53	466.726	162.900	303.826
544.0	7.52	466.904	163.200	303.704
545.0	7.51	467.081	163.500	303.581
546.0	7.50	467.259	163.800	303.459
547.0	7.49	467.436	164.100	303.336
548.0	7.47	467.613	164.400	303.213
549.0	7.46	467.789	164.700	303.089
550.0	7.45	467.966	165.000	302.966
551.0	7.44	468.142	165.300	302.842
552.0	7.43	468.318	165.600	302.718
553.0	7.42	468.493	165.900	302.593
554.0	7.41	468.669	166.200	302.469
555.0	7.40	468.844	166.500	302.344
556.0	7.39	469.018	166.800	302.218
557.0	7.38	469.193	167.100	302.093
558.0	7.37	469.367	167.400	301.967
559.0	7.36	469.541	167.700	301.841
560.0	7.35	469.715	168.000	301.715
561.0	7.34	469.888	168.300	301.588
562.0	7.33	470.061	168.600	301.461
563.0	7.32	470.234	168.900	301.334
564.0	7.31	470.407	169.200	301.207
565.0	7.30	470.579	169.500	301.079
566.0	7.29	470.751	169.800	300.951
567.0	7.28	470.923	170.100	300.823
568.0	7.27	471.095	170.400	300.695
569.0	7.26	471.266	170.700	300.566
570.0	7.25	471.437	171.000	300.437
571.0	7.23	471.608	171.300	300.308
572.0	7.22	471.778	171.600	300.178
573.0	7.21	471.949	171.900	300.049
574.0	7.20	472.119	172.200	299.919
575.0	7.20	472.288	172.500	299.788
576.0	7.19	472.458	172.800	299.658

577.0	7.18	472.627	173.100	299.527
578.0	7.17	472.796	173.400	299.396
579.0	7.16	472.965	173.700	299.265
580.0	7.15	473.134	174.000	299.134
581.0	7.14	473.302	174.300	299.002
582.0	7.13	473.470	174.600	298.870
583.0	7.12	473.638	174.900	298.738
584.0	7.11	473.805	175.200	298.605
585.0	7.10	473.973	175.500	298.473
586.0	7.09	474.140	175.800	298.340
587.0	7.08	474.307	176.100	298.207
588.0	7.07	474.473	176.400	298.073
589.0	7.06	474.640	176.700	297.940
590.0	7.05	474.806	177.000	297.806
591.0	7.04	474.971	177.300	297.671
592.0	7.03	475.137	177.600	297.537
593.0	7.02	475.302	177.900	297.402
594.0	7.01	475.468	178.200	297.268
595.0	7.00	475.633	178.500	297.133
596.0	6.99	475.797	178.800	296.997
597.0	6.98	475.962	179.100	296.862
598.0	6.97	476.126	179.400	296.726
599.0	6.97	476.290	179.700	296.590
600.0	6.96	476.454	180.000	296.454
601.0	6.95	476.617	180.300	296.317
602.0	6.94	476.780	180.600	296.180
603.0	6.93	476.943	180.900	296.043
604.0	6.92	477.106	181.200	295.906
605.0	6.91	477.269	181.500	295.769
606.0	6.90	477.431	181.800	295.631
607.0	6.89	477.593	182.100	295.493
608.0	6.88	477.755	182.400	295.355
609.0	6.87	477.917	182.700	295.217
610.0	6.87	478.078	183.000	295.078
611.0	6.86	478.240	183.300	294.940
612.0	6.85	478.401	183.600	294.801
613.0	6.84	478.561	183.900	294.661
614.0	6.83	478.722	184.200	294.522
615.0	6.82	478.882	184.500	294.382

616.0	6.81	479.042	184.800	294.242
617.0	6.80	479.202	185.100	294.102
618.0	6.79	479.362	185.400	293.962
619.0	6.79	479.521	185.700	293.821
620.0	6.78	479.681	186.000	293.681
621.0	6.77	479.840	186.300	293.540
622.0	6.76	479.998	186.600	293.398
623.0	6.75	480.157	186.900	293.257
624.0	6.74	480.315	187.200	293.115
625.0	6.73	480.473	187.500	292.973
626.0	6.73	480.631	187.800	292.831
627.0	6.72	480.789	188.100	292.689
628.0	6.71	480.947	188.400	292.547
629.0	6.70	481.104	188.700	292.404
630.0	6.69	481.261	189.000	292.261
631.0	6.68	481.418	189.300	292.118
632.0	6.67	481.574	189.600	291.974
633.0	6.67	481.731	189.900	291.831
634.0	6.66	481.887	190.200	291.687
635.0	6.65	482.043	190.500	291.543
636.0	6.64	482.199	190.800	291.399
637.0	6.63	482.354	191.100	291.254
638.0	6.62	482.510	191.400	291.110
639.0	6.62	482.665	191.700	290.965
640.0	6.61	482.820	192.000	290.820
641.0	6.60	482.975	192.300	290.675
642.0	6.59	483.129	192.600	290.529
643.0	6.58	483.284	192.900	290.384
644.0	6.58	483.438	193.200	290.238
645.0	6.57	483.592	193.500	290.092
646.0	6.56	483.745	193.800	289.945
647.0	6.55	483.899	194.100	289.799
648.0	6.54	484.052	194.400	289.652
649.0	6.54	484.205	194.700	289.505
650.0	6.53	484.358	195.000	289.358
651.0	6.52	484.511	195.300	289.211
652.0	6.51	484.664	195.600	289.064
653.0	6.50	484.816	195.900	288.916
654.0	6.50	484.968	196.200	288.768

655.0	6.49	485.120	196.500	288.620
656.0	6.48	485.272	196.800	288.472
657.0	6.47	485.423	197.100	288.323
658.0	6.46	485.575	197.400	288.175
659.0	6.46	485.726	197.700	288.026
660.0	6.45	485.877	198.000	287.877
661.0	6.44	486.028	198.300	287.728
662.0	6.43	486.178	198.600	287.578
663.0	6.43	486.329	198.900	287.429
664.0	6.42	486.479	199.200	287.279
665.0	6.41	486.629	199.500	287.129
666.0	6.40	486.778	199.800	286.978
667.0	6.39	486.928	200.100	286.828
668.0	6.39	487.078	200.400	286.678
669.0	6.38	487.227	200.700	286.527
670.0	6.37	487.376	201.000	286.376
671.0	6.36	487.525	201.300	286.225
672.0	6.36	487.673	201.600	286.073
673.0	6.35	487.822	201.900	285.922
674.0	6.34	487.970	202.200	285.770
675.0	6.33	488.118	202.500	285.618
676.0	6.33	488.266	202.800	285.466
677.0	6.32	488.414	203.100	285.314
678.0	6.31	488.561	203.400	285.161
679.0	6.30	488.709	203.700	285.009
680.0	6.30	488.856	204.000	284.856
681.0	6.29	489.003	204.300	284.703
682.0	6.28	489.150	204.600	284.550
683.0	6.28	489.296	204.900	284.396
684.0	6.27	489.443	205.200	284.243
685.0	6.26	489.589	205.500	284.089
686.0	6.25	489.735	205.800	283.935
687.0	6.25	489.881	206.100	283.781
688.0	6.24	490.026	206.400	283.626
689.0	6.23	490.172	206.700	283.472
690.0	6.22	490.317	207.000	283.317
691.0	6.22	490.462	207.300	283.162
692.0	6.21	490.607	207.600	283.007
693.0	6.20	490.752	207.900	282.852

694.0	6.20	490.897	208.200	282.697
695.0	6.19	491.041	208.500	282.541
696.0	6.18	491.186	208.800	282.386
697.0	6.17	491.330	209.100	282.230
698.0	6.17	491.474	209.400	282.074
699.0	6.16	491.617	209.700	281.917
700.0	6.15	491.761	210.000	281.761
701.0	6.15	491.904	210.300	281.604
702.0	6.14	492.047	210.600	281.447
703.0	6.13	492.191	210.900	281.291
704.0	6.13	492.333	211.200	281.133
705.0	6.12	492.476	211.500	280.976
706.0	6.11	492.619	211.800	280.819
707.0	6.11	492.761	212.100	280.661
708.0	6.10	492.903	212.400	280.503
709.0	6.09	493.045	212.700	280.345
710.0	6.08	493.187	213.000	280.187
711.0	6.08	493.329	213.300	280.029
712.0	6.07	493.470	213.600	279.870
713.0	6.06	493.612	213.900	279.712
714.0	6.06	493.753	214.200	279.553
715.0	6.05	493.894	214.500	279.394
716.0	6.04	494.034	214.800	279.234
717.0	6.04	494.175	215.100	279.075
718.0	6.03	494.316	215.400	278.916
719.0	6.02	494.456	215.700	278.756
720.0	6.02	494.596	216.000	278.596
721.0	6.01	494.736	216.300	278.436
722.0	6.00	494.876	216.600	278.276
723.0	6.00	495.016	216.900	278.116
724.0	5.99	495.155	217.200	277.955
725.0	5.98	495.294	217.500	277.794
726.0	5.98	495.434	217.800	277.634
727.0	5.97	495.573	218.100	277.473
728.0	5.96	495.711	218.400	277.311
729.0	5.96	495.850	218.700	277.150
730.0	5.95	495.989	219.000	276.989
731.0	5.95	496.127	219.300	276.827
732.0	5.94	496.265	219.600	276.665

733.0	5.93	496.403	219.900	276.503
734.0	5.93	496.541	220.200	276.341
735.0	5.92	496.679	220.500	276.179
736.0	5.91	496.816	220.800	276.016
737.0	5.91	496.954	221.100	275.854
738.0	5.90	497.091	221.400	275.691
739.0	5.89	497.228	221.700	275.528
740.0	5.89	497.365	222.000	275.365
741.0	5.88	497.502	222.300	275.202
742.0	5.87	497.638	222.600	275.038
743.0	5.87	497.775	222.900	274.875
744.0	5.86	497.911	223.200	274.711
745.0	5.86	498.047	223.500	274.547
746.0	5.85	498.183	223.800	274.383
747.0	5.84	498.319	224.100	274.219
748.0	5.84	498.455	224.400	274.055
749.0	5.83	498.590	224.700	273.890
750.0	5.82	498.726	225.000	273.726
751.0	5.82	498.861	225.300	273.561
752.0	5.81	498.996	225.600	273.396
753.0	5.81	499.131	225.900	273.231
754.0	5.80	499.265	226.200	273.065
755.0	5.79	499.400	226.500	272.900
756.0	5.79	499.535	226.800	272.735
757.0	5.78	499.669	227.100	272.569
758.0	5.78	499.803	227.400	272.403
759.0	5.77	499.937	227.700	272.237
760.0	5.76	500.071	228.000	272.071
761.0	5.76	500.204	228.300	271.904
762.0	5.75	500.338	228.600	271.738
763.0	5.75	500.471	228.900	271.571
764.0	5.74	500.605	229.200	271.405
765.0	5.73	500.738	229.500	271.238
766.0	5.73	500.871	229.800	271.071
767.0	5.72	501.003	230.100	270.903
768.0	5.72	501.136	230.400	270.736
769.0	5.71	501.269	230.700	270.569
770.0	5.70	501.401	231.000	270.401
771.0	5.70	501.533	231.300	270.233

772.0	5.69	501.665	231.600	270.065
773.0	5.69	501.797	231.900	269.897
774.0	5.68	501.929	232.200	269.729
775.0	5.67	502.061	232.500	269.561
776.0	5.67	502.192	232.800	269.392
777.0	5.66	502.323	233.100	269.223
778.0	5.66	502.455	233.400	269.055
779.0	5.65	502.586	233.700	268.886
780.0	5.65	502.717	234.000	268.717
781.0	5.64	502.847	234.300	268.547
782.0	5.63	502.978	234.600	268.378
783.0	5.63	503.108	234.900	268.208
784.0	5.62	503.239	235.200	268.039
785.0	5.62	503.369	235.500	267.869
786.0	5.61	503.499	235.800	267.699
787.0	5.61	503.629	236.100	267.529
788.0	5.60	503.759	236.400	267.359
789.0	5.59	503.888	236.700	267.188
790.0	5.59	504.018	237.000	267.018
791.0	5.58	504.147	237.300	266.847
792.0	5.58	504.276	237.600	266.676
793.0	5.57	504.405	237.900	266.505
794.0	5.57	504.534	238.200	266.334
795.0	5.56	504.663	238.500	266.163
796.0	5.56	504.792	238.800	265.992
797.0	5.55	504.920	239.100	265.820
798.0	5.54	505.049	239.400	265.649
799.0	5.54	505.177	239.700	265.477
800.0	5.53	505.305	240.000	265.305
801.0	5.53	505.433	240.300	265.133
802.0	5.52	505.561	240.600	264.961
803.0	5.52	505.689	240.900	264.789
804.0	5.51	505.816	241.200	264.616
805.0	5.51	505.944	241.500	264.444
806.0	5.50	506.071	241.800	264.271
807.0	5.49	506.198	242.100	264.098
808.0	5.49	506.325	242.400	263.925
809.0	5.48	506.452	242.700	263.752
810.0	5.48	506.579	243.000	263.579

811.0	5.47	506.705	243.300	263.405
812.0	5.47	506.832	243.600	263.232
813.0	5.46	506.958	243.900	263.058
814.0	5.46	507.084	244.200	262.884
815.0	5.45	507.211	244.500	262.711
816.0	5.45	507.337	244.800	262.537
817.0	5.44	507.462	245.100	262.362
818.0	5.44	507.588	245.400	262.188
819.0	5.43	507.714	245.700	262.014
820.0	5.43	507.839	246.000	261.839
821.0	5.42	507.964	246.300	261.664
822.0	5.41	508.090	246.600	261.490
823.0	5.41	508.215	246.900	261.315
824.0	5.40	508.340	247.200	261.140
825.0	5.40	508.464	247.500	260.964
826.0	5.39	508.589	247.800	260.789
827.0	5.39	508.713	248.100	260.613
828.0	5.38	508.838	248.400	260.438
829.0	5.38	508.962	248.700	260.262
830.0	5.37	509.086	249.000	260.086
831.0	5.37	509.210	249.300	259.910
832.0	5.36	509.334	249.600	259.734
833.0	5.36	509.458	249.900	259.558
834.0	5.35	509.582	250.200	259.382
835.0	5.35	509.705	250.500	259.205
836.0	5.34	509.829	250.800	259.029
837.0	5.34	509.952	251.100	258.852
838.0	5.33	510.075	251.400	258.675
839.0	5.33	510.198	251.700	258.498
840.0	5.32	510.321	252.000	258.321
841.0	5.32	510.444	252.300	258.144
842.0	5.31	510.566	252.600	257.966
843.0	5.31	510.689	252.900	257.789
844.0	5.30	510.811	253.200	257.611
845.0	5.30	510.933	253.500	257.433
846.0	5.29	511.056	253.800	257.256
847.0	5.29	511.178	254.100	257.078
848.0	5.28	511.299	254.400	256.899
849.0	5.28	511.421	254.700	256.721

850.0	5.27	511.543	255.000	256.543
851.0	5.27	511.664	255.300	256.364
852.0	5.26	511.786	255.600	256.186
853.0	5.26	511.907	255.900	256.007
854.0	5.25	512.028	256.200	255.828
855.0	5.25	512.149	256.500	255.649
856.0	5.24	512.270	256.800	255.470
857.0	5.24	512.391	257.100	255.291
858.0	5.23	512.512	257.400	255.112
859.0	5.23	512.632	257.700	254.932
860.0	5.22	512.753	258.000	254.753
861.0	5.22	512.873	258.300	254.573
862.0	5.21	512.993	258.600	254.393
863.0	5.21	513.113	258.900	254.213
864.0	5.20	513.233	259.200	254.033
865.0	5.20	513.353	259.500	253.853
866.0	5.19	513.473	259.800	253.673
867.0	5.19	513.593	260.100	253.493
868.0	5.18	513.712	260.400	253.312
869.0	5.18	513.831	260.700	253.131
870.0	5.17	513.951	261.000	252.951
871.0	5.17	514.070	261.300	252.770
872.0	5.17	514.189	261.600	252.589
873.0	5.16	514.308	261.900	252.408
874.0	5.16	514.427	262.200	252.227
875.0	5.15	514.545	262.500	252.045
876.0	5.15	514.664	262.800	251.864
877.0	5.14	514.782	263.100	251.682
878.0	5.14	514.901	263.400	251.501
879.0	5.13	515.019	263.700	251.319
880.0	5.13	515.137	264.000	251.137
881.0	5.12	515.255	264.300	250.955
882.0	5.12	515.373	264.600	250.773
883.0	5.11	515.491	264.900	250.591
884.0	5.11	515.608	265.200	250.408
885.0	5.10	515.726	265.500	250.226
886.0	5.10	515.843	265.800	250.043
887.0	5.10	515.960	266.100	249.860
888.0	5.09	516.078	266.400	249.678

889.0	5.09	516.195	266.700	249.495
890.0	5.08	516.312	267.000	249.312
891.0	5.08	516.429	267.300	249.129
892.0	5.07	516.545	267.600	248.945
893.0	5.07	516.662	267.900	248.762
894.0	5.06	516.778	268.200	248.578
895.0	5.06	516.895	268.500	248.395
896.0	5.05	517.011	268.800	248.211
897.0	5.05	517.127	269.100	248.027
898.0	5.05	517.243	269.400	247.843
899.0	5.04	517.359	269.700	247.659
900.0	5.04	517.475	270.000	247.475
901.0	5.03	517.591	270.300	247.291
902.0	5.03	517.707	270.600	247.107
903.0	5.02	517.822	270.900	246.922
904.0	5.02	517.938	271.200	246.738
905.0	5.01	518.053	271.500	246.553
906.0	5.01	518.168	271.800	246.368
907.0	5.01	518.283	272.100	246.183
908.0	5.00	518.398	272.400	245.998
909.0	5.00	518.513	272.700	245.813
910.0	4.99	518.628	273.000	245.628
911.0	4.99	518.743	273.300	245.443
912.0	4.98	518.857	273.600	245.257
913.0	4.98	518.972	273.900	245.072
914.0	4.97	519.086	274.200	244.886
915.0	4.97	519.200	274.500	244.700
916.0	4.97	519.314	274.800	244.514
917.0	4.96	519.428	275.100	244.328
918.0	4.96	519.542	275.400	244.142
919.0	4.95	519.656	275.700	243.956
920.0	4.95	519.770	276.000	243.770
921.0	4.94	519.883	276.300	243.583
922.0	4.94	519.997	276.600	243.397
923.0	4.94	520.110	276.900	243.210
924.0	4.93	520.223	277.200	243.023
925.0	4.93	520.337	277.500	242.837
926.0	4.92	520.450	277.800	242.650
927.0	4.92	520.563	278.100	242.463

928.0	4.91	520.676	278.400	242.276
929.0	4.91	520.788	278.700	242.088
930.0	4.91	520.901	279.000	241.901
931.0	4.90	521.014	279.300	241.714
932.0	4.90	521.126	279.600	241.526
933.0	4.89	521.238	279.900	241.338
934.0	4.89	521.351	280.200	241.151
935.0	4.89	521.463	280.500	240.963
936.0	4.88	521.575	280.800	240.775
937.0	4.88	521.687	281.100	240.587
938.0	4.87	521.799	281.400	240.399
939.0	4.87	521.910	281.700	240.210
940.0	4.86	522.022	282.000	240.022
941.0	4.86	522.134	282.300	239.834
942.0	4.86	522.245	282.600	239.645
943.0	4.85	522.356	282.900	239.456
944.0	4.85	522.468	283.200	239.268
945.0	4.84	522.579	283.500	239.079
946.0	4.84	522.690	283.800	238.890
947.0	4.84	522.801	284.100	238.701
948.0	4.83	522.911	284.400	238.511
949.0	4.83	523.022	284.700	238.322
950.0	4.82	523.133	285.000	238.133
951.0	4.82	523.243	285.300	237.943
952.0	4.82	523.354	285.600	237.754
953.0	4.81	523.464	285.900	237.564
954.0	4.81	523.574	286.200	237.374
955.0	4.80	523.685	286.500	237.185
956.0	4.80	523.795	286.800	236.995
957.0	4.80	523.905	287.100	236.805
958.0	4.79	524.014	287.400	236.614
959.0	4.79	524.124	287.700	236.424
960.0	4.78	524.234	288.000	236.234
961.0	4.78	524.343	288.300	236.043
962.0	4.78	524.453	288.600	235.853
963.0	4.77	524.562	288.900	235.662
964.0	4.77	524.671	289.200	235.471
965.0	4.76	524.781	289.500	235.281
966.0	4.76	524.890	289.800	235.090

967.0	4.76	524.999	290.100	234.899
968.0	4.75	525.107	290.400	234.707
969.0	4.75	525.216	290.700	234.516
970.0	4.74	525.325	291.000	234.325
971.0	4.74	525.434	291.300	234.134
972.0	4.74	525.542	291.600	233.942
973.0	4.73	525.650	291.900	233.750
974.0	4.73	525.759	292.200	233.559
975.0	4.72	525.867	292.500	233.367
976.0	4.72	525.975	292.800	233.175
977.0	4.72	526.083	293.100	232.983
978.0	4.71	526.191	293.400	232.791
979.0	4.71	526.299	293.700	232.599
980.0	4.71	526.407	294.000	232.407
981.0	4.70	526.514	294.300	232.214
982.0	4.70	526.622	294.600	232.022
983.0	4.69	526.729	294.900	231.829
984.0	4.69	526.837	295.200	231.637
985.0	4.69	526.944	295.500	231.444
986.0	4.68	527.051	295.800	231.251
987.0	4.68	527.158	296.100	231.058
988.0	4.67	527.265	296.400	230.865
989.0	4.67	527.372	296.700	230.672
990.0	4.67	527.479	297.000	230.479
991.0	4.66	527.586	297.300	230.286
992.0	4.66	527.692	297.600	230.092
993.0	4.66	527.799	297.900	229.899
994.0	4.65	527.905	298.200	229.705
995.0	4.65	528.011	298.500	229.511
996.0	4.64	528.118	298.800	229.318
997.0	4.64	528.224	299.100	229.124
998.0	4.64	528.330	299.400	228.930
999.0	4.63	528.436	299.700	228.736
1000.0	4.63	528.542	300.000	228.542
1001.0	4.63	528.648	300.300	228.348
1002.0	4.62	528.753	300.600	228.153
1003.0	4.62	528.859	300.900	227.959
1004.0	4.62	528.965	301.200	227.765
1005.0	4.61	529.070	301.500	227.570

1006.0	4.61	529.175	301.800	227.375
1007.0	4.60	529.281	302.100	227.181
1008.0	4.60	529.386	302.400	226.986
1009.0	4.60	529.491	302.700	226.791
1010.0	4.59	529.596	303.000	226.596
1011.0	4.59	529.701	303.300	226.401
1012.0	4.59	529.806	303.600	226.206
1013.0	4.58	529.910	303.900	226.010
1014.0	4.58	530.015	304.200	225.815
1015.0	4.58	530.119	304.500	225.619
1016.0	4.57	530.224	304.800	225.424
1017.0	4.57	530.328	305.100	225.228
1018.0	4.56	530.433	305.400	225.033
1019.0	4.56	530.537	305.700	224.837
1020.0	4.56	530.641	306.000	224.641
1021.0	4.55	530.745	306.300	224.445
1022.0	4.55	530.849	306.600	224.249
1023.0	4.55	530.953	306.900	224.053
1024.0	4.54	531.057	307.200	223.857
1025.0	4.54	531.160	307.500	223.660
1026.0	4.54	531.264	307.800	223.464
1027.0	4.53	531.367	308.100	223.267
1028.0	4.53	531.471	308.400	223.071
1029.0	4.53	531.574	308.700	222.874
1030.0	4.52	531.677	309.000	222.677
1031.0	4.52	531.781	309.300	222.481
1032.0	4.51	531.884	309.600	222.284
1033.0	4.51	531.987	309.900	222.087
1034.0	4.51	532.090	310.200	221.890
1035.0	4.50	532.192	310.500	221.692
1036.0	4.50	532.295	310.800	221.495
1037.0	4.50	532.398	311.100	221.298
1038.0	4.49	532.500	311.400	221.100
1039.0	4.49	532.603	311.700	220.903
1040.0	4.49	532.705	312.000	220.705
1041.0	4.48	532.808	312.300	220.508
1042.0	4.48	532.910	312.600	220.310
1043.0	4.48	533.012	312.900	220.112
1044.0	4.47	533.114	313.200	219.914

1045.0	4.47	533.216	313.500	219.716
1046.0	4.47	533.318	313.800	219.518
1047.0	4.46	533.420	314.100	219.320
1048.0	4.46	533.521	314.400	219.121
1049.0	4.46	533.623	314.700	218.923
1050.0	4.45	533.725	315.000	218.725
1051.0	4.45	533.826	315.300	218.526
1052.0	4.45	533.928	315.600	218.328
1053.0	4.44	534.029	315.900	218.129
1054.0	4.44	534.130	316.200	217.930
1055.0	4.44	534.231	316.500	217.731
1056.0	4.43	534.332	316.800	217.532
1057.0	4.43	534.433	317.100	217.333
1058.0	4.43	534.534	317.400	217.134
1059.0	4.42	534.635	317.700	216.935
1060.0	4.42	534.736	318.000	216.736
1061.0	4.42	534.837	318.300	216.537
1062.0	4.41	534.937	318.600	216.337
1063.0	4.41	535.038	318.900	216.138
1064.0	4.41	535.138	319.200	215.938
1065.0	4.40	535.238	319.500	215.738
1066.0	4.40	535.339	319.800	215.539
1067.0	4.40	535.439	320.100	215.339
1068.0	4.39	535.539	320.400	215.139
1069.0	4.39	535.639	320.700	214.939
1070.0	4.39	535.739	321.000	214.739
1071.0	4.38	535.839	321.300	214.539
1072.0	4.38	535.939	321.600	214.339
1073.0	4.38	536.038	321.900	214.138
1074.0	4.37	536.138	322.200	213.938
1075.0	4.37	536.238	322.500	213.738
1076.0	4.37	536.337	322.800	213.537
1077.0	4.36	536.436	323.100	213.336
1078.0	4.36	536.536	323.400	213.136
1079.0	4.36	536.635	323.700	212.935
1080.0	4.35	536.734	324.000	212.734
1081.0	4.35	536.833	324.300	212.533
1082.0	4.35	536.932	324.600	212.332
1083.0	4.34	537.031	324.900	212.131

1084.0	4.34	537.130	325.200	211.930
1085.0	4.34	537.229	325.500	211.729
1086.0	4.33	537.327	325.800	211.527
1087.0	4.33	537.426	326.100	211.326
1088.0	4.33	537.525	326.400	211.125
1089.0	4.32	537.623	326.700	210.923
1090.0	4.32	537.721	327.000	210.721
1091.0	4.32	537.820	327.300	210.520
1092.0	4.32	537.918	327.600	210.318
1093.0	4.31	538.016	327.900	210.116
1094.0	4.31	538.114	328.200	209.914
1095.0	4.31	538.212	328.500	209.712
1096.0	4.30	538.310	328.800	209.510
1097.0	4.30	538.408	329.100	209.308
1098.0	4.30	538.506	329.400	209.106
1099.0	4.29	538.603	329.700	208.903
1100.0	4.29	538.701	330.000	208.701
1101.0	4.29	538.799	330.300	208.499
1102.0	4.28	538.896	330.600	208.296
1103.0	4.28	538.993	330.900	208.093
1104.0	4.28	539.091	331.200	207.891
1105.0	4.27	539.188	331.500	207.688
1106.0	4.27	539.285	331.800	207.485
1107.0	4.27	539.382	332.100	207.282
1108.0	4.27	539.479	332.400	207.079
1109.0	4.26	539.576	332.700	206.876
1110.0	4.26	539.673	333.000	206.673
1111.0	4.26	539.770	333.300	206.470
1112.0	4.25	539.867	333.600	206.267
1113.0	4.25	539.963	333.900	206.063
1114.0	4.25	540.060	334.200	205.860
1115.0	4.24	540.156	334.500	205.656
1116.0	4.24	540.253	334.800	205.453
1117.0	4.24	540.349	335.100	205.249
1118.0	4.23	540.445	335.400	205.045
1119.0	4.23	540.541	335.700	204.841
1120.0	4.23	540.638	336.000	204.638
1121.0	4.23	540.734	336.300	204.434
1122.0	4.22	540.830	336.600	204.230

1123.0	4.22	540.926	336.900	204.026
1124.0	4.22	541.021	337.200	203.821
1125.0	4.21	541.117	337.500	203.617
1126.0	4.21	541.213	337.800	203.413
1127.0	4.21	541.308	338.100	203.208
1128.0	4.20	541.404	338.400	203.004
1129.0	4.20	541.499	338.700	202.799
1130.0	4.20	541.595	339.000	202.595
1131.0	4.20	541.690	339.300	202.390
1132.0	4.19	541.785	339.600	202.185
1133.0	4.19	541.881	339.900	201.981
1134.0	4.19	541.976	340.200	201.776
1135.0	4.18	542.071	340.500	201.571
1136.0	4.18	542.166	340.800	201.366
1137.0	4.18	542.261	341.100	201.161
1138.0	4.17	542.355	341.400	200.955
1139.0	4.17	542.450	341.700	200.750
1140.0	4.17	542.545	342.000	200.545
1141.0	4.17	542.639	342.300	200.339
1142.0	4.16	542.734	342.600	200.134
1143.0	4.16	542.828	342.900	199.928
1144.0	4.16	542.923	343.200	199.723
1145.0	4.15	543.017	343.500	199.517
1146.0	4.15	543.111	343.800	199.311
1147.0	4.15	543.206	344.100	199.106
1148.0	4.15	543.300	344.400	198.900
1149.0	4.14	543.394	344.700	198.694
1150.0	4.14	543.488	345.000	198.488
1151.0	4.14	543.582	345.300	198.282
1152.0	4.13	543.676	345.600	198.076
1153.0	4.13	543.769	345.900	197.869
1154.0	4.13	543.863	346.200	197.663
1155.0	4.13	543.957	346.500	197.457
1156.0	4.12	544.050	346.800	197.250
1157.0	4.12	544.144	347.100	197.044
1158.0	4.12	544.237	347.400	196.837
1159.0	4.11	544.330	347.700	196.630
1160.0	4.11	544.424	348.000	196.424
1161.0	4.11	544.517	348.300	196.217

1162.0	4.11	544.610	348.600	196.010
1163.0	4.10	544.703	348.900	195.803
1164.0	4.10	544.796	349.200	195.596
1165.0	4.10	544.889	349.500	195.389
1166.0	4.09	544.982	349.800	195.182
1167.0	4.09	545.075	350.100	194.975
1168.0	4.09	545.168	350.400	194.768
1169.0	4.09	545.260	350.700	194.560
1170.0	4.08	545.353	351.000	194.353
1171.0	4.08	545.445	351.300	194.145
1172.0	4.08	545.538	351.600	193.938
1173.0	4.07	545.630	351.900	193.730
1174.0	4.07	545.723	352.200	193.523
1175.0	4.07	545.815	352.500	193.315
1176.0	4.07	545.907	352.800	193.107
1177.0	4.06	545.999	353.100	192.899
1178.0	4.06	546.091	353.400	192.691
1179.0	4.06	546.183	353.700	192.483
1180.0	4.06	546.275	354.000	192.275
1181.0	4.05	546.367	354.300	192.067
1182.0	4.05	546.459	354.600	191.859
1183.0	4.05	546.551	354.900	191.651
1184.0	4.04	546.642	355.200	191.442
1185.0	4.04	546.734	355.500	191.234
1186.0	4.04	546.825	355.800	191.025
1187.0	4.04	546.917	356.100	190.817
1188.0	4.03	547.008	356.400	190.608
1189.0	4.03	547.100	356.700	190.400
1190.0	4.03	547.191	357.000	190.191
1191.0	4.03	547.282	357.300	189.982
1192.0	4.02	547.373	357.600	189.773
1193.0	4.02	547.464	357.900	189.564
1194.0	4.02	547.555	358.200	189.355
1195.0	4.01	547.646	358.500	189.146
1196.0	4.01	547.737	358.800	188.937
1197.0	4.01	547.828	359.100	188.728
1198.0	4.01	547.919	359.400	188.519
1199.0	4.00	548.009	359.700	188.309
1200.0	4.00	548.100	360.000	188.100

1201.0	4.00	548.190	360.300	187.890
1202.0	4.00	548.281	360.600	187.681
1203.0	3.99	548.371	360.900	187.471
1204.0	3.99	548.462	361.200	187.262
1205.0	3.99	548.552	361.500	187.052
1206.0	3.99	548.642	361.800	186.842
1207.0	3.98	548.732	362.100	186.632
1208.0	3.98	548.823	362.400	186.423
1209.0	3.98	548.913	362.700	186.213
1210.0	3.97	549.003	363.000	186.003
1211.0	3.97	549.093	363.300	185.793
1212.0	3.97	549.182	363.600	185.582
1213.0	3.97	549.272	363.900	185.372
1214.0	3.96	549.362	364.200	185.162
1215.0	3.96	549.452	364.500	184.952
1216.0	3.96	549.541	364.800	184.741
1217.0	3.96	549.631	365.100	184.531
1218.0	3.95	549.720	365.400	184.320
1219.0	3.95	549.810	365.700	184.110
1220.0	3.95	549.899	366.000	183.899
1221.0	3.95	549.988	366.300	183.688
1222.0	3.94	550.077	366.600	183.477
1223.0	3.94	550.167	366.900	183.267
1224.0	3.94	550.256	367.200	183.056
1225.0	3.94	550.345	367.500	182.845
1226.0	3.93	550.434	367.800	182.634
1227.0	3.93	550.523	368.100	182.423
1228.0	3.93	550.611	368.400	182.211
1229.0	3.93	550.700	368.700	182.000
1230.0	3.92	550.789	369.000	181.789
1231.0	3.92	550.878	369.300	181.578
1232.0	3.92	550.966	369.600	181.366
1233.0	3.91	551.055	369.900	181.155
1234.0	3.91	551.143	370.200	180.943
1235.0	3.91	551.232	370.500	180.732
1236.0	3.91	551.320	370.800	180.520
1237.0	3.90	551.408	371.100	180.308
1238.0	3.90	551.497	371.400	180.097
1239.0	3.90	551.585	371.700	179.885

1240.0	3.90	551.673	372.000	179.673
1241.0	3.89	551.761	372.300	179.461
1242.0	3.89	551.849	372.600	179.249
1243.0	3.89	551.937	372.900	179.037
1244.0	3.89	552.025	373.200	178.825
1245.0	3.88	552.113	373.500	178.613
1246.0	3.88	552.200	373.800	178.400
1247.0	3.88	552.288	374.100	178.188
1248.0	3.88	552.376	374.400	177.976
1249.0	3.87	552.463	374.700	177.763
1250.0	3.87	552.551	375.000	177.551
1251.0	3.87	552.638	375.300	177.338
1252.0	3.87	552.726	375.600	177.126
1253.0	3.86	552.813	375.900	176.913
1254.0	3.86	552.900	376.200	176.700
1255.0	3.86	552.987	376.500	176.487
1256.0	3.86	553.074	376.800	176.274
1257.0	3.85	553.162	377.100	176.062
1258.0	3.85	553.249	377.400	175.849
1259.0	3.85	553.336	377.700	175.636
1260.0	3.85	553.423	378.000	175.423
1261.0	3.85	553.509	378.300	175.209
1262.0	3.84	553.596	378.600	174.996
1263.0	3.84	553.683	378.900	174.783
1264.0	3.84	553.770	379.200	174.570
1265.0	3.84	553.856	379.500	174.356
1266.0	3.83	553.943	379.800	174.143
1267.0	3.83	554.029	380.100	173.929
1268.0	3.83	554.116	380.400	173.716
1269.0	3.83	554.202	380.700	173.502
1270.0	3.82	554.288	381.000	173.288
1271.0	3.82	554.375	381.300	173.075
1272.0	3.82	554.461	381.600	172.861
1273.0	3.82	554.547	381.900	172.647
1274.0	3.81	554.633	382.200	172.433
1275.0	3.81	554.719	382.500	172.219
1276.0	3.81	554.805	382.800	172.005
1277.0	3.81	554.891	383.100	171.791
1278.0	3.80	554.977	383.400	171.577

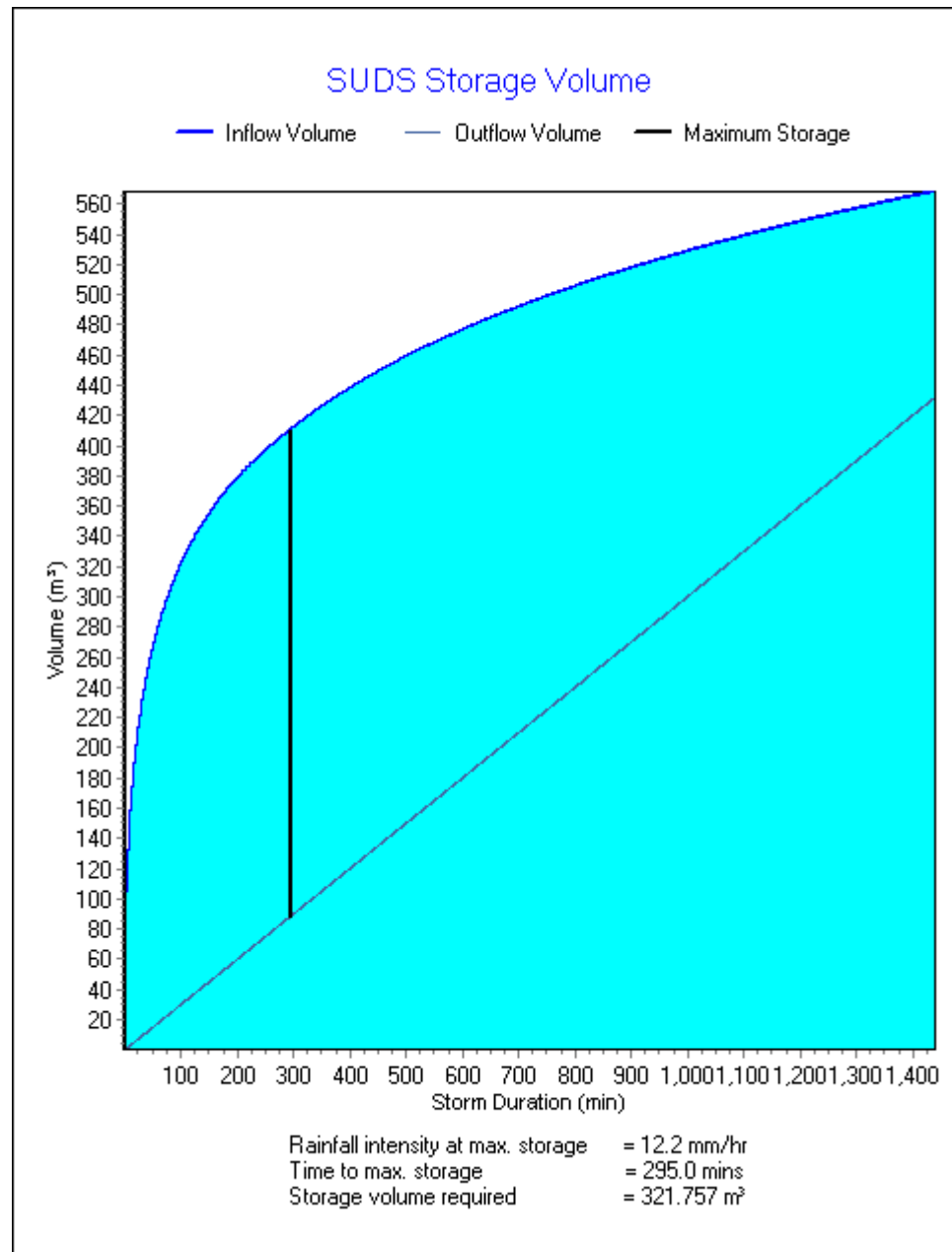
1279.0	3.80	555.063	383.700	171.363
1280.0	3.80	555.149	384.000	171.149
1281.0	3.80	555.234	384.300	170.934
1282.0	3.79	555.320	384.600	170.720
1283.0	3.79	555.406	384.900	170.506
1284.0	3.79	555.491	385.200	170.291
1285.0	3.79	555.577	385.500	170.077
1286.0	3.78	555.662	385.800	169.862
1287.0	3.78	555.747	386.100	169.647
1288.0	3.78	555.833	386.400	169.433
1289.0	3.78	555.918	386.700	169.218
1290.0	3.78	556.003	387.000	169.003
1291.0	3.77	556.088	387.300	168.788
1292.0	3.77	556.173	387.600	168.573
1293.0	3.77	556.258	387.900	168.358
1294.0	3.77	556.343	388.200	168.143
1295.0	3.76	556.428	388.500	167.928
1296.0	3.76	556.513	388.800	167.713
1297.0	3.76	556.598	389.100	167.498
1298.0	3.76	556.682	389.400	167.282
1299.0	3.75	556.767	389.700	167.067
1300.0	3.75	556.852	390.000	166.852
1301.0	3.75	556.936	390.300	166.636
1302.0	3.75	557.021	390.600	166.421
1303.0	3.75	557.105	390.900	166.205
1304.0	3.74	557.190	391.200	165.990
1305.0	3.74	557.274	391.500	165.774
1306.0	3.74	557.358	391.800	165.558
1307.0	3.74	557.443	392.100	165.343
1308.0	3.73	557.527	392.400	165.127
1309.0	3.73	557.611	392.700	164.911
1310.0	3.73	557.695	393.000	164.695
1311.0	3.73	557.779	393.300	164.479
1312.0	3.72	557.863	393.600	164.263
1313.0	3.72	557.947	393.900	164.047
1314.0	3.72	558.031	394.200	163.831
1315.0	3.72	558.114	394.500	163.614
1316.0	3.72	558.198	394.800	163.398
1317.0	3.71	558.282	395.100	163.182

1318.0	3.71	558.366	395.400	162.966
1319.0	3.71	558.449	395.700	162.749
1320.0	3.71	558.533	396.000	162.533
1321.0	3.70	558.616	396.300	162.316
1322.0	3.70	558.700	396.600	162.100
1323.0	3.70	558.783	396.900	161.883
1324.0	3.70	558.866	397.200	161.666
1325.0	3.70	558.949	397.500	161.449
1326.0	3.69	559.033	397.800	161.233
1327.0	3.69	559.116	398.100	161.016
1328.0	3.69	559.199	398.400	160.799
1329.0	3.69	559.282	398.700	160.582
1330.0	3.68	559.365	399.000	160.365
1331.0	3.68	559.448	399.300	160.148
1332.0	3.68	559.531	399.600	159.931
1333.0	3.68	559.614	399.900	159.714
1334.0	3.68	559.696	400.200	159.496
1335.0	3.67	559.779	400.500	159.279
1336.0	3.67	559.862	400.800	159.062
1337.0	3.67	559.944	401.100	158.844
1338.0	3.67	560.027	401.400	158.627
1339.0	3.66	560.109	401.700	158.409
1340.0	3.66	560.192	402.000	158.192
1341.0	3.66	560.274	402.300	157.974
1342.0	3.66	560.357	402.600	157.757
1343.0	3.66	560.439	402.900	157.539
1344.0	3.65	560.521	403.200	157.321
1345.0	3.65	560.603	403.500	157.103
1346.0	3.65	560.686	403.800	156.886
1347.0	3.65	560.768	404.100	156.668
1348.0	3.64	560.850	404.400	156.450
1349.0	3.64	560.932	404.700	156.232
1350.0	3.64	561.014	405.000	156.014
1351.0	3.64	561.096	405.300	155.796
1352.0	3.64	561.177	405.600	155.577
1353.0	3.63	561.259	405.900	155.359
1354.0	3.63	561.341	406.200	155.141
1355.0	3.63	561.423	406.500	154.923
1356.0	3.63	561.504	406.800	154.704

1357.0	3.63	561.586	407.100	154.486
1358.0	3.62	561.667	407.400	154.267
1359.0	3.62	561.749	407.700	154.049
1360.0	3.62	561.830	408.000	153.830
1361.0	3.62	561.912	408.300	153.612
1362.0	3.61	561.993	408.600	153.393
1363.0	3.61	562.074	408.900	153.174
1364.0	3.61	562.155	409.200	152.955
1365.0	3.61	562.236	409.500	152.736
1366.0	3.61	562.318	409.800	152.518
1367.0	3.60	562.399	410.100	152.299
1368.0	3.60	562.480	410.400	152.080
1369.0	3.60	562.561	410.700	151.861
1370.0	3.60	562.642	411.000	151.642
1371.0	3.60	562.722	411.300	151.422
1372.0	3.59	562.803	411.600	151.203
1373.0	3.59	562.884	411.900	150.984
1374.0	3.59	562.965	412.200	150.765
1375.0	3.59	563.045	412.500	150.545
1376.0	3.58	563.126	412.800	150.326
1377.0	3.58	563.207	413.100	150.107
1378.0	3.58	563.287	413.400	149.887
1379.0	3.58	563.367	413.700	149.667
1380.0	3.58	563.448	414.000	149.448
1381.0	3.57	563.528	414.300	149.228
1382.0	3.57	563.609	414.600	149.009
1383.0	3.57	563.689	414.900	148.789
1384.0	3.57	563.769	415.200	148.569
1385.0	3.57	563.849	415.500	148.349
1386.0	3.56	563.929	415.800	148.129
1387.0	3.56	564.009	416.100	147.909
1388.0	3.56	564.089	416.400	147.689
1389.0	3.56	564.169	416.700	147.469
1390.0	3.56	564.249	417.000	147.249
1391.0	3.55	564.329	417.300	147.029
1392.0	3.55	564.409	417.600	146.809
1393.0	3.55	564.489	417.900	146.589
1394.0	3.55	564.568	418.200	146.368
1395.0	3.55	564.648	418.500	146.148

1396.0	3.54	564.728	418.800	145.928
1397.0	3.54	564.807	419.100	145.707
1398.0	3.54	564.887	419.400	145.487
1399.0	3.54	564.966	419.700	145.266
1400.0	3.54	565.046	420.000	145.046
1401.0	3.53	565.125	420.300	144.825
1402.0	3.53	565.204	420.600	144.604
1403.0	3.53	565.284	420.900	144.384
1404.0	3.53	565.363	421.200	144.163
1405.0	3.53	565.442	421.500	143.942
1406.0	3.52	565.521	421.800	143.721
1407.0	3.52	565.600	422.100	143.500
1408.0	3.52	565.679	422.400	143.279
1409.0	3.52	565.758	422.700	143.058
1410.0	3.52	565.837	423.000	142.837
1411.0	3.51	565.916	423.300	142.616
1412.0	3.51	565.995	423.600	142.395
1413.0	3.51	566.074	423.900	142.174
1414.0	3.51	566.153	424.200	141.953
1415.0	3.51	566.231	424.500	141.731
1416.0	3.50	566.310	424.800	141.510
1417.0	3.50	566.389	425.100	141.289
1418.0	3.50	566.467	425.400	141.067
1419.0	3.50	566.546	425.700	140.846
1420.0	3.50	566.624	426.000	140.624
1421.0	3.49	566.702	426.300	140.402
1422.0	3.49	566.781	426.600	140.181
1423.0	3.49	566.859	426.900	139.959
1424.0	3.49	566.937	427.200	139.737
1425.0	3.49	567.016	427.500	139.516
1426.0	3.48	567.094	427.800	139.294
1427.0	3.48	567.172	428.100	139.072
1428.0	3.48	567.250	428.400	138.850
1429.0	3.48	567.328	428.700	138.628
1430.0	3.48	567.406	429.000	138.406
1431.0	3.47	567.484	429.300	138.184
1432.0	3.47	567.562	429.600	137.962
1433.0	3.47	567.640	429.900	137.740
1434.0	3.47	567.718	430.200	137.518

1435.0	3.47	567.795	430.500	137.295
1436.0	3.46	567.873	430.800	137.073
1437.0	3.46	567.951	431.100	136.851
1438.0	3.46	568.028	431.400	136.628
1439.0	3.46	568.106	431.700	136.406
1440.0	3.46	568.184	432.000	136.184



Appendix G Ground Investigation Report

PHASE I & II GEO-ENVIRONMENTAL ASSESSMENT

KYNGS GOLF & COUNTRY CLUB,
STATION ROAD, MARKET BOSWORTH

MR G DENNY

SEPTEMBER 2017



Trial pits 9, 10 and 11 were excavated in the mounds where the car park is proposed to assess whether the material can be re-used elsewhere on site to aid final profiling. The material encountered included brick, concrete, asphalt and plastic bags in TP11 that is considered to be unsuitable for re-use within the raising of the site levels, roads or car park.

Additional Investigation

For Plots 7-15, which are proposed to be on stilts among the artificial lakes, it is recommended that a separate investigation is carried out using cable percussion boreholes. These could include installations in order to carry out gas and groundwater monitoring.

6.3 EXCAVATION & GROUNDWATER CONDITIONS

All trial pits remained stable during excavation and groundwater was not encountered in any of the exploratory holes. Therefore, it is considered that excavations should remain stable in the short term.

6.4 SOAKAWAYS

Infiltration testing was not undertaken in any of the trial pits, and based on the Wolston Clay Formation underlying the majority of the site; it is considered soakaways will not be a viable option for surface water drainage.

Although not investigated at this stage, there is a possibility that soakaways may be appropriate in the sand and gravel deposits near the north-east corner, adjacent to Plots 7-15. However, this cannot be confirmed until further investigation is carried out.

6.5 BURIED CONCRETE

Based on the recorded water soluble sulphate concentrations and pH values it is considered appropriate to adopt a Basic Design Sulphate Class of DS-1, together with an Aggressive Chemical Environment of Concrete (ACEC) of AC-1. Mobile groundwater conditions have been assumed for this determination.

APPENDIX D





Mr G Denny

Market Bosworth Golf Course

Dimensions:

IV.149.17

Casing record			Chiselling records									
Date	Diameter (mm)	Depth (m)	Time	From (m)	To (m)	Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks	
Remarks: 1. Trial pit reinstated with arisings upon completion. 2. Trial pit remained stable during excavation. 3. Groundwater not encountered.									Logged By:	Checked By:	Date	Scale
									JH	SH	19.09.17	NTS

 Scotland Farm, Fair Lane, Gcalsbrook, DE22 3RX info@ivyhouse.co.uk • www.ivyhouse.co.uk • 01532 830 488			Date: 30th August 2017 Ground Level: Orientation: Coordinates: Plant: JCB Dimensions:										TRIAL PIT NO. TP2	
CLIENT Mr G Denny													Sheet No. 1 of 1	
SITE LOCATION Market Bosworth Golf Course													Job No. IV.149.17	
Description of Strata	Reduced level (m)	Legend	Depth (Thickness) m	SAMPLES/TESTS			SPT Results					N Value	Installation	Test Sample Details
				Depth	No	Type	Seating		Test Drive					
							75mm	75mm	75mm	75mm	75mm			
TOPSOIL	0.05 0.10 0.15 0.20 0.25 0.30 0.35 0.40 0.45 0.50 0.55 0.60 0.65 0.70		0.70 (0.70)	0.50	1	ES								
MADE GROUND: Reddish brown gravelly slightly clayey SAND. Gravel is fine to coarse angular to subrounded brick and quartz.	0.75 0.80 0.85 0.90 0.95 1.00 1.05 1.10 1.15 1.20 1.25 1.30		1.30 (0.60)	1.00	2	ES								
Firm greyish brown slightly sandy CLAY.	1.35 1.40 1.45 1.50 1.55 1.60 1.65 1.70 1.75 1.80 1.85 1.90 1.95 2.00 2.05 2.10 2.15 2.20 2.25 2.30 2.35 2.40 2.45 2.50 2.55 2.60 2.65 2.70 2.75 2.80 2.85 2.90 2.95 3.00 3.05 3.10 3.15 3.20		3.20 (1.90)	1.35	3	ES								
Becoming Bluish grey mottled brown from 2.20mbgl.				1.50	1	D								
				3.10	2	D								
End of trial pit at 3.20mbgl.	3.25 3.30 3.35 3.40 3.45 3.50 3.55 3.60 3.65 3.70 3.75 3.80 3.85 3.90 3.95 4.00													

Casing record			Chiselling records								
Date	Diameter (mm)	Depth (m)	Time	From (m)	To (m)	Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks
Remarks: 1. Trial pit reinstated with arisings upon completion. 2. Trial pit remained stable during excavation. 3. Groundwater not encountered.								Logged By:	Checked By:	Date	Scale
								JH	SH	19.09.17	NTS

 Scotland Farm, Fair Lane, Gossbrook, DE22 3RX info@ivyhouse.co.uk • www.ivyhouse.co.uk • 01532 820 488			Date: 30th August 2017										TRIAL PIT NO. TP3	
CLIENT Mr G Denny			Ground Level:										Sheet No. 1 of 1	
SITE LOCATION Market Bosworth Golf Course			Orientation:										Job No.	
			Coordinates:										IV.149.17	
			Plant: JCB											
			Dimensions:											
Description of Strata	Reduced level (m)	Legend	Depth (Thickness) m	SAMPLES/TESTS			SPT Results					N Value	Installation	Test Sample Details
				Depth	No	Type	Seating		Test Drive					
							75mm	75mm	75mm	75mm	75mm			
MADE GROUND: Hardcore.	0.05 0.10 0.15 0.20 0.25 0.30 0.35 0.40 0.45		0.45 (0.45)	0.25	1	ES								
Firm brown mottled grey slightly sandy CLAY.	0.50 0.55 0.60 0.65 0.70 0.75 0.80 0.85 0.90		0.90 (0.45)	0.50	2	ES								
Firm bluish grey mottled brown CLAY	0.95 1.00 1.05 1.10 1.15 1.20 1.25 1.30 1.35 1.40 1.45 1.50 1.55 1.60 1.65 1.70 1.75 1.80 1.85 1.90 1.95 2.00 2.05 2.10 2.15 2.20 2.25 2.30 2.35 2.40 2.45 2.50 2.55 2.60 2.65 2.70 2.75 2.80 2.85 2.90		2.90 (2.00)	1.00	1	D								
Becoming stiff from 2.0mbgl.				2.50	2	D								
End of trial pit at 2.90mbgl.	2.95 3.00 3.05 3.10 3.15 3.20 3.25 3.30 3.35 3.40 3.45 3.50 3.55 3.60 3.65 3.70 3.75 3.80 3.85 3.90 3.95 4.00													

Casing record			Chiselling records								
Date	Diameter (mm)	Depth (m)	Time	From (m)	To (m)	Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks
Remarks: 1. Trial pit reinstated with arisings upon completion. 2. Trial pit remained stable during excavation. 3. Groundwater not encountered.								Logged By:	Checked By:	Date	Scale
								JH	SH	19.09.17	NTS



Mr G Denny

Market Bosworth Golf Course

Dimensions:

IV.149.17

Casing record			Chiselling records								
Date	Diameter (mm)	Depth (m)	Time	From (m)	To (m)	Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks
Remarks: 1. Trial pit reinstated with arisings upon completion. 2. Trial pit remained stable during excavation. 3. Groundwater not encountered.								Logged By:	Checked By:	Date	Scale
								JH	SH	19.09.17	NTS

 Scotland Farm, Fair Lane, Golebrook, DE22 3RX info@ivyhouse.co.uk • www.ivyhouse.co.uk • 01532 820 488			Date: 30th August 2017						TRIAL PIT NO. TP5					
CLIENT Mr G Denny			Ground Level:						Sheet No. 1 of 1					
SITE LOCATION Market Bosworth Golf Course			Orientation:						Job No.					
			Coordinates:						IV.149.17					
			Plant: JCB											
			Dimensions:											
Description of Strata	Reduced level (m)	Legend	Depth (Thickness) m	SAMPLES/TESTS			SPT Results					N Value	Installation	Test Sample Details
				Depth	No	Type	Seating		Test Drive					
							75mm	75mm	75mm	75mm	75mm			
MADE GROUND: Hardcore.	0.05 0.10 0.15 0.20 0.25 0.30 0.35 0.40 0.45 0.50		0.50 (0.50)	0.10	1	ES								
Firm brown mottled grey slightly sandy CLAY.	0.55 0.60 0.65 0.70 0.75 0.80 0.85 0.90 0.95 1.00 1.05 1.10 1.15 1.20 1.25 1.30 1.35 1.40 1.45 1.50		1.50 (1.00)	0.70	2	ES								
Firm bluish grey mottled brown CLAY	1.55 1.60 1.65 1.70 1.75 1.80 1.85 1.90 1.95 2.00 2.05 2.10 2.15 2.20 2.25 2.30 2.35 2.40 2.45 2.50 2.55 2.60 2.65 2.70 2.75 2.80		2.80 (1.30)	1.20	1	D								
Becoming stiff from 2.0mbgl.	2.85 2.90 2.95 3.00 3.05 3.10 3.15 3.20 3.25 3.30 3.35 3.40 3.45 3.50 3.55 3.60 3.65 3.70 3.75 3.80 3.85 3.90 3.95 4.00			2.10	2	D								
End of trial pit at 2.80mbgl.				2.70	3	D								

Casing record			Chiselling records								
Date	Diameter (mm)	Depth (m)	Time	From (m)	To (m)	Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks
Remarks: 1. Trial pit reinstated with arisings upon completion. 2. Trial pit remained stable during excavation. 3. Groundwater not encountered.								Logged By:	Checked By:	Date	Scale
								JH	SH	19.09.17	NTS

 Scotland Farm, Fair Lane, Goscote, DE22 3RX info@ivyhouse.co.uk • www.ivyhouse.co.uk • 01532 820 488				Date: 30th August 2017 Ground Level: Orientation: Coordinates: Plant: JCB Dimensions:				TRIAL PIT NO. TP6							
CLIENT Mr G Denny								Sheet No. 1 of 1							
SITE LOCATION Market Bosworth Golf Course								Job No. IV.149.17							
Description of Strata	Reduced level (m)	Legend	Depth (Thickness) m	SAMPLES/TESTS			SPT Results						N Value	Installation	Test Sample Details
				Depth	No	Type	Seating		Test Drive						
							75mm	75mm	75mm	75mm	75mm	75mm			
TOPSOIL	0.05 0.10 0.15 0.20 0.25 0.30 0.35 0.40 0.45 0.50		0.50 (0.50)	0.40	1	ES									
Firm orangish brown sandy very gravelly CLAY. Gravel is fine to coarse angular to subrounded quartz and flint.	0.55 0.60 0.65 0.70 0.75 0.80 0.85 0.90		0.90 (0.40)	0.70	2	ES									
Firm bluish grey and brown CLAY. Becoming stiff from 1.50mbgl.	0.95 1.00 1.05 1.10 1.15 1.20 1.25 1.30 1.35 1.40 1.45 1.50 1.55 1.60 1.65 1.70 1.75 1.80 1.85 1.90 1.95 2.00 2.05 2.10 2.15 2.20 2.25 2.30 2.35 2.40 2.45 2.50 2.55 2.60 2.65 2.70 2.75 2.80 2.85 2.90		2.90 (2.00)	1.20 1.30 2.00	3 1 2	ES D D									
End of trial pit at 2.90mbgl.	2.95 3.00 3.05 3.10 3.15 3.20 3.25 3.30 3.35 3.40 3.45 3.50 3.55 3.60 3.65 3.70 3.75 3.80 3.85 3.90 3.95 4.00 4.05														

Casing record			Chiselling records								
Date	Diameter (mm)	Depth (m)	Time	From (m)	To (m)	Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks

Remarks:

1. Trial pit reinstated with arisings upon completion.
 2. Trial pit remained stable during excavation.

Logged By: Checked By: Date: Scale:

14 14 10.08.17 NTS



CLIENT

Mr G Denny

SITE LOCATION

Market Bosworth Golf Course

Date: 30th August 2017

Ground Level:

Orientation:

Coordinates:

Plant: JCB

Dimensions:

TRIAL PIT NO.

TP7

Sheet No. 1 of 1

Job No.

IV.149.17

[illegible]

Casing record			Chiselling records									
Date	Diameter (mm)	Depth (m)	Time	From (m)	To (m)	Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks	
Remarks: 1. Trial pit reinstated with arisings upon completion. 2. Trial pit remained stable during excavation. 3. Groundwater not encountered.									Logged By:	Checked By:	Date	Scale
									JH	SH	19.09.17	NTS

 Scotland Farm, Fair Lane, Gossbrook, DE72 3RX info@ivyhouse.co.uk • www.ivyhouse.co.uk • 01532 830 488				Date: 30th August 2017 Ground Level: Orientation: Coordinates: Plant: JCB Dimensions:				TRIAL PIT NO. TP8							
CLIENT Mr G Denny								Sheet No. 1 of 1							
SITE LOCATION Market Bosworth Golf Course								Job No. IV.149.17							
Description of Strata	Reduced level (m)	Legend	Depth (Thickness) m	SAMPLES/TESTS			SPT Results						N Value	Installation	Test Sample Details
				Depth	No	Type	Seating		Test Drive						
							75mm	75mm	75mm	75mm	75mm	75mm			
Grass over soft orangish brown sandy very gravelly CLAY. Gravel is fine to coarse angular to subrounded quartz and flint.	0.05 0.10 0.15 0.20 0.25 0.30 0.35 0.40 0.45 0.50 0.55 0.60 0.65 0.70		0.70 (0.70)	0.20	1	ES									
Firm bluish grey and brown CLAY.	0.75 0.80 0.85 0.90 0.95 1.00 1.05 1.10 1.15 1.20 1.25 1.30 1.35 1.40 1.45 1.50 1.55 1.60 1.65 1.70 1.75 1.80 1.85 1.90 1.95 2.00 2.05 2.10 2.15 2.20 2.25 2.30 2.35 2.40 2.45 2.50 2.55 2.60 2.65 2.70 2.75 2.80 2.85 2.90 2.95 3.00		3.00 (2.30)	0.90 1.10	2 1	ES D									
Becoming stiff from 1.50mbgl.				2.90	2	D									
End of trial pit at 3.00mbgl.	3.05 3.10 3.15 3.20 3.25 3.30 3.35 3.40 3.45 3.50 3.55 3.60 3.65 3.70 3.75 3.80 3.85 3.90 3.95 4.00														

Casing record			Chiselling records									
Date	Diameter (mm)	Depth (m)	Time	From (m)	To (m)	Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks	
Remarks: 1. Trial pit reinstated with arisings upon completion. 2. Trial pit remained stable during excavation. 3. Groundwater not encountered.									Logged By:	Checked By:	Date	Scale
									JH	SH	19.09.17	NTS

 Scotland Farm, Fair Lane, Gcalsbrook, DE22 3RX info@ivyhouse.co.uk • www.ivyhouse.co.uk • 01532 820 488				Date: 30th August 2017 Ground Level: Orientation: Coordinates: Plant: JCB Dimensions:				TRIAL PIT NO. TP9							
CLIENT Mr G Denny								Sheet No. 1 of 1							
SITE LOCATION Market Bosworth Golf Course								Job No. IV.149.17							
Description of Strata	Reduced level (m)	Legend	Depth (Thickness) m	SAMPLES/TESTS			SPT Results						N Value	Installation	Test Sample Details
				Depth	No	Type	Seating		Test Drive						
							75mm	75mm	75mm	75mm	75mm	75mm			
MADE GROUND: Dark brownish black SAND and GRAVEL of brick, concrete, patio slabs, asphalt and plastic bags. High cobble content of brick and concrete.	0.05 0.10 0.15 0.20 0.25 0.30 0.35 0.40 0.45 0.50 0.55 0.60 0.65 0.70 0.75 0.80 0.85 0.90 0.95 1.00 1.05 1.10 1.15 1.20 1.25 1.30 1.35 1.40 1.45 1.50 1.55 1.60 1.65 1.70 1.75 1.80 1.85 1.90 1.95 2.00 2.05 2.10 2.15 2.20 2.25 2.30 2.35 2.40 2.45 2.50 2.55 2.60 2.65 2.70 2.75 2.80		2.80 (2.80)	0.80	1	ES									
Stiff bluish grey and brown CLAY.	2.85 2.90 2.95 3.00 3.05 3.10 3.15 3.20 3.25 3.30 3.35 3.40		3.40 (0.60)	3.20	2	ES									
End of trial pit at 3.40mbgl.	3.45 3.50 3.55 3.60 3.65 3.70 3.75 3.80 3.85 3.90 3.95 4.00														

Casing record			Chiselling records									
Date	Diameter (mm)	Depth (m)	Time	From (m)	To (m)	Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks	
Remarks: 1. Trial pit reinstated with arisings upon completion. 2. Trial pit remained stable during excavation. 3. Groundwater not encountered.									Logged By:	Checked By:	Date	Scale
									JH	SH	19.09.17	NTS



CLIENT

Mr G Denny

SITE LOCATION

Market Bosworth Golf Course

Date: 30th August 2017

Ground Level:

Orientation:

Coordinates:

Plant: JCB

Dimensions:

TRIAL PIT NO.

TP10

Sheet No. 1 of 1

Job No.

IV.149.17

[illegible]

Casing record			Chiselling records									
Date	Diameter (mm)	Depth (m)	Time	From (m)	To (m)	Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks	
Remarks: 1. Trial pit reinstated with arisings upon completion. 2. Trial pit remained stable during excavation. 3. Groundwater not encountered.									Logged By:	Checked By:	Date	Scale
									JH	SH	19.09.17	NTS



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CLIENT
Mr G Denny

SITE LOCATION
Market Bosworth Golf Course

Date: 30th August 2017
Ground Level:
Orientation:
Coordinates:
Plant: JCB
Dimensions:

TRIAL PIT NO.
TP11
Sheet No. 1 of 1
Job No.
IV.149.17

Description of Strata	Reduced level (m)	Legend	Depth (Thickness) m	SAMPLES/TESTS			SPT Results						N Value	Installation	Test Sample Details
				Depth	No	Type	Seating		Test Drive						
							75mm	75mm	75mm	75mm	75mm	75mm			
MADE GROUND: Brown gravelly SAND. Gravel is coarse subangular and subrounded brick, flint and quartz.	0.05 0.10 0.15 0.20 0.25 0.30 0.35 0.40 0.45 0.50 0.55 0.60 0.65 0.70 0.75 0.80 0.85 0.90 0.95 1.00 1.05 1.10 1.15 1.20 1.25 1.30		1.30 (1.30)	0.40	1	ES									
MADE GROUND: Greyish black gravelly SAND. Gravel is coarse brick and concrete with electrical cable and plastic sheeting.	1.35 1.40 1.45 1.50 1.55 1.60 1.65 1.70 1.75 1.80 1.85 1.90 1.95 2.00 2.05 2.10 2.15 2.20 2.25 2.30 2.35 2.40 2.45 2.50 2.55 2.60 2.65 2.70 2.75 2.80 2.85 2.90 2.95 3.00 3.05 3.10 3.15 3.20 3.25 3.30		3.30 (2.00)	2.90	2	ES									
Firm orangish brown CLAY.	3.35 3.40 3.45 3.50		3.50 (0.20)	3.40	3	ES									
End of trial pit at 3.50mbgl.	3.55 3.60 3.65 3.70 3.75 3.80 3.85 3.90 3.95 4.00 4.05														

Casing record			Chiselling records								
Date	Diameter (mm)	Depth (m)	Time	From (m)	To (m)	Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks

Remarks:

1. Trial pit reinstated with arisings upon completion.
2. Trial pit remained stable during excavation.

Logged By:
Checked By:
Date:
Scale:

14
14
10.08.17
NTS