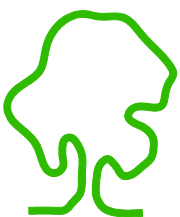


MARTIN MCDONAGH

FRYERN PARK FARM, FRYERN PARK, FRYERN ROAD,
STORRINGTON, WEST SUSSEX RH20 4FF

Drainage Design Strategy

June 2026
(Revised July 2026)



eas ltd

Environmental Assessment Services Ltd

REPORT DATA SHEET

Requirement	Data
Report Reference	919/MartinMcDonagh/FryernParkFarm/DDS
Date	June 2026
Client	Martin McDonagh
Report type	Surface Water and Foul Drainage Strategy
Purpose	Planning
Revisions	July 2026



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Drainage Design Strategy

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MARTIN MCDONAGH

**FRYERN PARK FARM, FRYERN PARK, FRYERN ROAD,
STORRINGTON, WEST SUSSEX RH20 4FF**

Drainage Design Strategy

June 2026
(Revised July 2026)

1. EXISTING SITE & PROPOSED DEVELOPMENT

- 1.1 The site lies to the north of the road Fryern Park and is presently used for the keeping of horses, comprising stables, barn and shed. The site area is approximately 0.43 ha. The Ordnance Survey (OS) map reference for the site is TQ 08189 15199. The site elevation is approximately +36 m OD. See Appendix A for the site location plan.
- 1.2 According to the British Geological Survey (available online), the site lies on Hythe Formation – Sandstone. Online Environment Agency (EA) groundwater mapping identifies the site to lie on a principal aquifer. The site does not lie within a groundwater source protection zone.
- 1.3 The proposal consists of changing the land use to a mixed use including keeping of horses and a residential gypsy/traveller site. This would comprise of four pitches, for both a static caravan and touring caravan, as well as the erection of two ancillary amenity buildings.

2. FLOOD RISK ASSESSMENT

- 2.1 According to the EA online Flood Map for Planning, the site lies within Flood Zone 1. The nearest area within Flood Zones 2 and 3 are located approximately 300 m west of the site, associated with the River Stor.
- 2.2 The EA online Risk of Flooding from Surface Water map shows that the site is not at risk of surface water flooding.
- 2.3 As the site is less than 1 ha in area and lies within Flood Zone 1, there is no requirement for a flood risk assessment under the National Planning Policy Framework (NPPF) and associated guidance documents.
- 2.4 In this case, it is required by Horsham District Council that all runoff for the 1 in 100-year flood event, plus allowance for climate change and urban creep, will be managed on site, and that the discharge from the proposed development will be restricted to 1 in 1 year Greenfield run-off rate.

3. EXISTING DRAINAGE

- 3.1 The site was visited on 3 June 2026 in order to examine the existing drainage (and carry out percolation testing). See Appendix B for site photographs.
- 3.2 Formal drainage on the site, as existing, comprises surface water and foul water drainage chambers near the southern boundary of site and an excavated area where a sewage treatment plant was formerly located (we were informed by the client that this had been stolen recently). The hole was approximately 2.0 m in depth and no groundwater was seen at the time of our visit.
- 3.3 Drainage ditches were located along the western side of the access road immediately west of site and along the south of Fryern Park road beneath the hedging. Both ditches appeared overgrown. We were informed by the client that the materials to be used in the hardstanding areas are to be permeable.
- 3.4 As required by Horsham District Council, the flow permitted to leave the developed site should not exceed the 1 in 1 year Greenfield flow rate. The Greenfield runoff rate for the site has therefore been estimated using the UK Sustainable Drainage (UKSUDS) Greenfield Runoff Estimation Tool. The runoff rates are given for scenarios up to (and including) the 1 in 100-year storm event, as summarised in Table 3.1 below and provided in Appendix D.

TABLE 3.1
GREENFIELD RUNOFF RATES

Return period	Flow rates (l/s)
Qbar	0.9
1 in 1 year	0.7
1 in 10 year	1.4
1 in 30 year	2.0
1 in 100 year	2.8

- 3.5 According to the DEFRA non-statutory technical standards for sustainable drainage systems, the maximum discharge permitted to leave the whole site post development should not exceed 0.7 l/s.
- 3.6 The foul sewage should also be allowed for in the permitted discharge flow rate. The peak foul sewage design flow has been calculated for the proposed site as 0.2 l/s (see Section 6 below); therefore the surface water discharge should not exceed 0.5 l/s.

4. PROPOSED DRAINAGE

4.1 The proposed development may increase the impermeable area of the site compared to its former use, which could increase the peak flow following a rainfall event. It has been estimated that following development, 0.03 ha of the site will comprise impermeable surfacing, and the rest (0.40 ha) will be permeable. The permeable areas will still be discharged informally as Greenfield (as existing) and only the controlled drainage from the impermeable areas will be subject to SuDS measures.

4.2 It has been required that the drainage design of the developed site should retain onsite flows up to the 1 in 100-year return period event, including an allowance for climate change and urban creep. The ways in which this can be achieved are discussed in 4.3 and 4.4 below.

4.3 Drainage to Soakaway

4.3.1 Drainage to soakaway (infiltration) is the preferred Sustainable Urban Drainage System (SUDS) solution. The underlying sandstone may be considered a suitable medium for soakaway. Percolation testing was undertaken at the site on 3 June 2026 in order to investigate the practicality of soakaway as a method of disposal of surface water. Due to timing of the planning application, it was not possible to conduct percolation testing during the winter months.

4.3.2 Percolation testing comprised the excavation of a trial pit to 1.0 m below ground level in order to examine the geology at the site. The trial pit was located at the southwestern corner of the site. No groundwater was encountered during the excavation. No groundwater was observed in the nearby excavation for the sewage treatment plant, approximate depth 2.0 m. The geology appeared to comprise of made ground down to 0.5 m and yellow brown sand to 1.0 m.

4.3.3 Percolation testing was undertaken on site in accordance with BRE DG 365 following a period of heavy rain and stormy weather on 2 June 2026. An infiltration rate was calculated as 4.39×10^{-6} . Drainage to soakaway is therefore considered to be a feasible option for the site.

4.4 Other Sustainable Urban Drainage System (SUDS) Options

4.4.1 Additional SUDS options to be included on site comprise the use of permeable paving in hardstanding areas. Permeable paving will permit surface water to infiltrate into the underlying structure, delay discharge and reduce peak flows following a rainfall event. It is recommended that the permeable paving be underlain by a shallow drainage blanket connected to the surface water drainage system.

4.4.2 Rainwater harvesting could also be practised. Rainwater could be used for irrigation purposes within the garden via water butts connected to roof downpipes.

- 4.4.3 It may be possible to incorporate a green roof into the proposed design. Green roofs reduce the volume and rate of runoff, as well as improve the overall quality of surface water discharged. Green roofs can be low maintenance, generally requiring bi-annual maintenance visits.

4.5 Extreme event

- 4.5.1 If an extreme storm event overwhelmed the surface water drainage system at the site, and/or if the drainage system were to fail, ground levels would indicate that surface water would discharge off the western and southern site boundaries and onto the access road before flowing into the drainage ditches south and west of site, as per the present situation.

5. SURFACE WATER DRAINAGE DESIGN

5.1 Design Philosophy

- 5.1.1 The drainage strategy is for surface water to be drained into soakaway located close to the western site boundary. See Appendix A for the suggested drainage arrangement. Site levels were estimated based on information provided by OS maps.

5.2 Design Storm

- 5.2.1 The surface water drainage system has been designed for the 1 in 30-year return period event with 10% urban creep, plus a 35% allowance for climate change and tested for surcharge for the 1 in 100-year return period event (1% Annual Exceedance Probability) plus a 45% allowance for climate change. See Appendix A, Figure 3 for the proposed drainage design and Appendix E for pipe and chamber layout from the MasterDrain model and sizing of the soakaway from the HR Wallingford model.

5.3 Drainage Design Model

- 5.3.1 The soakaway has been designed to accommodate the 1 in 100-year return period storm event plus a 45% allowance for climate change using the MasterDrain network model.
- 5.3.2 An appropriate size for ring soakaways with concrete ring diameters of 2.4 m has been calculated as 9.6 m length, 4.8 m width and a minimum height of 0.7 m.

5.4 Hydrogeological Data

- 5.4.1 Hydrological data based on FEH22 rainfall data for the site and applied to the MasterDrain model. Chamber details, pipe sizes and levels are shown in Appendix E and summarised in Table 5.1 below:

TABLE 5.1
SURFACE WATER DRAINAGE

Ref.	Dia (mm)	Cover level (mAOD)	Invert level (mAOD)	Pipe dia in (mm)	Pipe dia out (mm)
SW1	450	37.00	36.50	-	100
SW2	600	37.00	36.35	100	100
SW3	450	36.00	35.50	-	100
SW4	600	36.00	35.36	100	100
SW5	450	36.00	35.50	-	100
Soakaway	-	36.00	35.16	100, 100, 100	-

6. FOUL SEWERAGE

- 6.1 Existing foul sewerage on site comprises a foul water chamber near the southern boundary of site and an excavated area where a sewage treatment plant was formerly located (we were informed by the client that this had been stolen recently). No public foul sewers are located on Fryern Park road or in the vicinity of the site, see Appendix C: Southern Water Sewer Plans. Foul sewerage for the proposed development comprises installation of a sewage treatment plant adjacent to the paddocks, with outfall discharged into a drainage field located in the adjacent paddocks. The existing sewage treatment plant location would not be suitable for continued use due to proximity to the site boundary being less than 5 m.
- 6.2 The new sewage treatment system will require no permit from the Environment Agency (EA) but will be required to adhere to the general binding rules for small sewage discharge to the ground provided by the EA.
- 6.3 The daily discharge calculator V2.0 (July 2019) provided by the EA calculates the proposed site's daily effluent treated by the proposed sewage treatment plant to be 1.8 cubic metres per day. As such a package treatment plant capable of managing this volume would be required.
- 6.4 A suitable drainage field size has been calculated as trenches of 62 m total length and 0.6 m trench width arranged as shown in Appendix A, suggested drainage design.
- 6.5 According to the WRc publication "Sewers for Adoption" (8th Edition), the design (peak) flow from a proposed residential development should be based on water use of 5000 l/dwelling/day. The proposed development comprises of four dwellings. This gives the overall (peak) foul sewage design flow for the site as 0.2 l/s.
- 6.6 The results of the sewerage design from the MasterDrain Foul analysis given in Appendix E are summarised in Table 6.1 below and illustrated in Appendix A:

TABLE 6.1
FOUL SEWERAGE

Ref.	Dia (mm)	Cover level (mAOD)	Invert level (mAOD)	Pipe dia in (mm)	Pipe dia out (mm)
FW1	450	36.00	35.50	-	100
FW2	450	36.00	35.33	100	100
FW3	450	36.00	35.50	-	100
FW4	450	36.00	35.23	100	100
FW5	450	37.00	36.50	-	100
STP	-	35.00	34.50	100, 100, 100	100
DRAINAGE FIELD	-	35.00	34.42	100	-

7. OPERATION AND MAINTENANCE

7.1 The drainage system will generally require minimal operational input once construction has been completed. However, it will require some regular maintenance. The maintenance of the drainage system will be the responsibility of the owner of the site to manage and charge where appropriate.

7.2 Required maintenance will include:

- The chambers, gullies, gutters and channels will require regular removal of any silt or other debris. Maintenance should be carried out at the time of year after most leaf fall has occurred.
- The sewage treatment plant will require regular maintenance including monthly visual inspections for damage, wear and corrosion as well as overall security; cleaning every 6 – 12 months, based on usage; removal of debris as and when necessary; and inspection of pumps and control systems every three months, and annual maintenance by a licenced contractor.

7.3 Required maintenance in accordance with the CIRIA SuDS Manual (C753) for a soakaway is summarised in Table 8.1:

TABLE 8.1
OPERATION AND MAINTENANCE REQUIREMENTS FOR
SOAKAWAY

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Inspect for sediment and debris in pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	Annually
	Cleaning of gutters and any filters on downpipes	Annually (or as required based on inspections)
	Trimming any roots that may be causing blockages	Annually (or as required)
Occasional maintenance	Remove sediment and debris in pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	As required, based on inspections
Remedial action	Reconstruct soakaway and/or replace or clean void fill, if performance deteriorates or failure occurs	As required
	Replacement of clogged geotextile (will require reconstruction of soakaway)	As required
Monitoring	Inspect silt traps and note rate of sediment accumulation	Monthly in the first year and then annually
	Check soakaway to ensure emptying is occurring	Annually

- 7.4 In accordance with the CIRIA SuDS Manual (C753) the pollution hazard level for the development is considered to be very low for the residential roofs and low for individual property driveways. For the roofs, it is advised to remove gross solids and sediments to satisfy requirements. For the driveways and access road, the simple index approach to determine pollution control measures should be applied. As such the proposed permeable surfacing is considered an adequate control measure.

8. CONCLUSIONS

- 8.1 Planning permission is being sought for a change in land use to mixed use including keeping of horses and a residential gypsy/traveller site. This would comprise of four pitches, for both a static caravan and touring caravan, as well as the erection of two ancillary amenity buildings. It is required that all runoff for the 1 in 100 year flood event, plus allowance for climate change and urban creep, will be managed on site, and that the discharge from the proposed development will be restricted to Greenfield runoff rate.
- 8.2 The site lies within Flood Zone 1, at low risk of tidal and fluvial flooding, and is also shown to not be at risk of surface water flooding.
- 8.3 Formal drainage on the site, as existing, comprises surface water and foul water drainage chambers near the southern boundary of site and an excavated area where a sewage treatment plant was formerly located (we were informed by the client that this had been stolen recently). Drainage ditches were located along the western side of the access road immediately west of site, and along the south of Fryern Park road beneath the hedging.
- 8.4 It is considered that the proposed development will result in an increase in the impermeable area of the site compared to its prior use. This will increase the peak flow following a rainfall event and may increase the flood risk elsewhere. It is estimated that following development 0.03 ha of the site will comprise impermeable surface and the remainder will consist of permeable surfacing.
- 8.5 The preferred sustainable (SUDS) surface water drainage solution for the site would be drainage to soakaway. The underlying geology comprises Hythe Formation Sandstone. The trial pit excavated at the site revealed the geology to comprise made ground down to 0.5 m below surface and sand down to 1.0 m. Percolation testing undertaken at the site revealed that drainage to soakaway would be practicable option for the site.
- 8.6 It is considered that eight ring soakaways with concrete diameters of 2.4 m and 0.7 m height would be appropriate to provide the required storage volume for surface water.
- 8.7 Additional SUDS options which could be incorporated into the development include rainwater harvesting for garden irrigation purposes via the provision of water butts, and green roofs on the static caravans and amenity buildings.
- 8.8 The foul sewerage drainage scheme for the dwelling comprises installation of a sewage treatment plant, with discharge into a drainage field located in the paddocks to the east of the site.

9. RECOMMENDATIONS

9.1 The drainage system will generally require minimal operational input once construction has been completed. However, it will require some regular maintenance:

- The chambers, gullies, gutters and channels will require regular removal of any silt or other debris. Maintenance should be carried out at the time of year after most leaf fall has occurred.
- The sewage treatment plant will require regular maintenance, including monthly visual inspections for damage, wear and corrosion as well as overall security; cleaning every 6 – 12 months, based on usage; removal of debris as and when necessary; and inspection of pumps and control systems every three months.
- It is advised to remove gross solids and sediments from the roofs as and when necessary.

☆☆☆☆☆☆

**APPENDIX A:
Figures**

**Site Location Plan
Proposed Site Plan
Suggested Drainage Design**

FRYERN PARK, STORRINGTON



Plan Produced for: PHILIP BROWN ASSOCIATES

Date Produced: 26 Jan 2026

Plan Reference Number:TQRQM26026170435656

Scale: 1:1250 @ A4

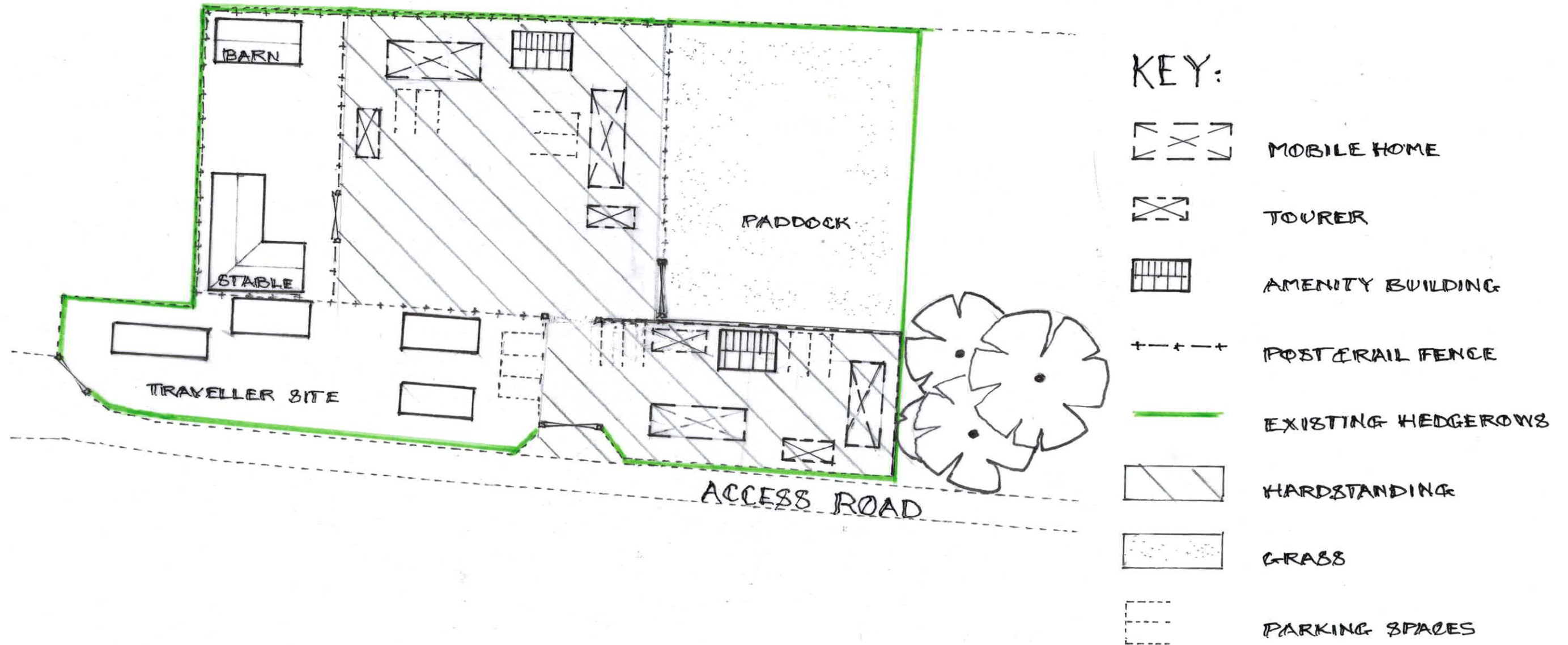
© Crown copyright and database rights 2025 OS 100042766



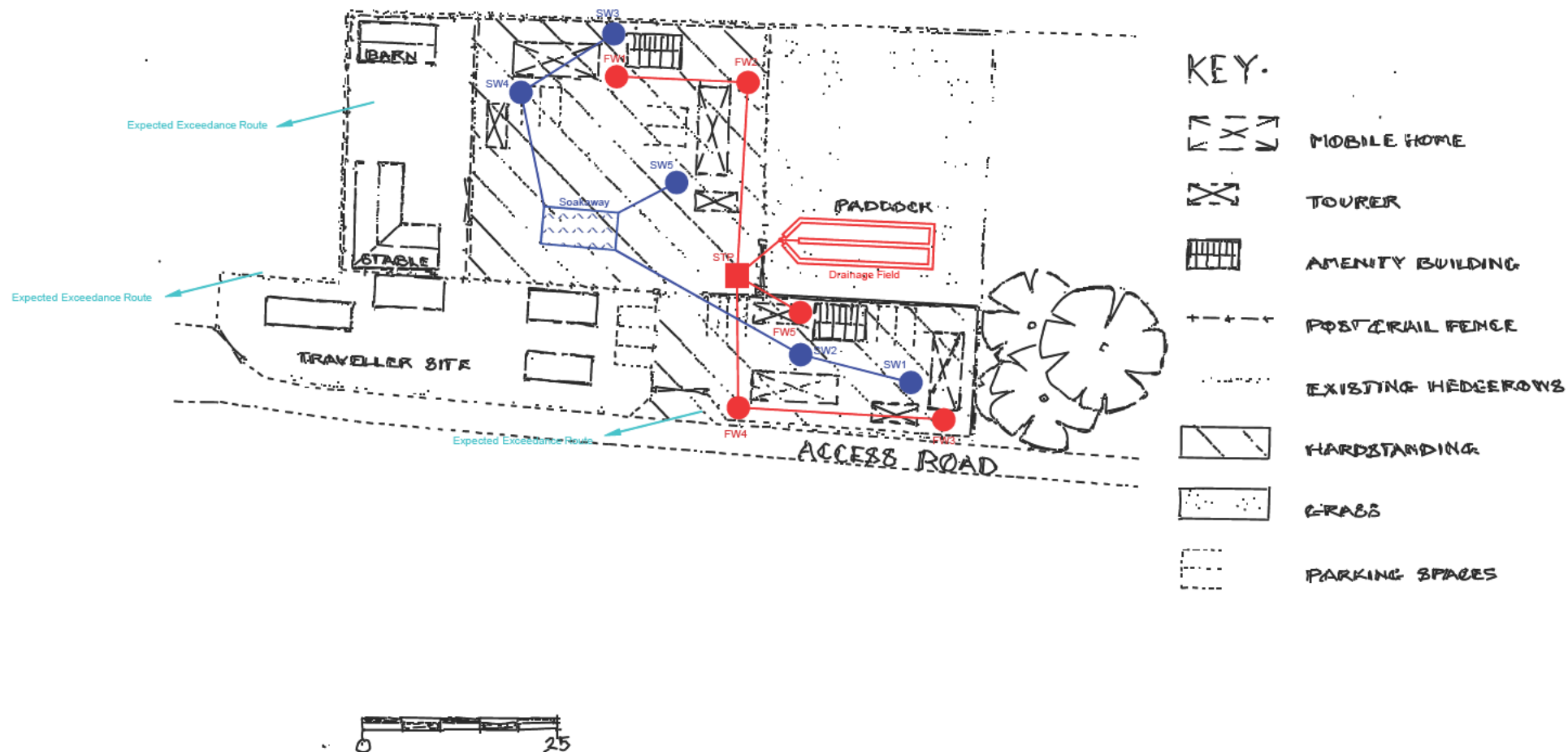
FRYERN PARK FARM

SITE LAYOUT PLAN

SCALE 1:500



FRYERN PARK FARM SITE LAYOUT PLAN SCALE 1:500



MARTIN MCDONAGH

Scale as shown

FRYERN PARK FARM, FRYERN PARK, FRYERN ROAD,
STORRINGTON, WEST SUSSEX RH20 4FF

Suggested Drainage Design

July 2026

APPENDIX B

Site Photographs

Excavated trial pit



Excavated soil



Sewage treatment plant location



APPENDIX C

Southern Water Sewer Plans

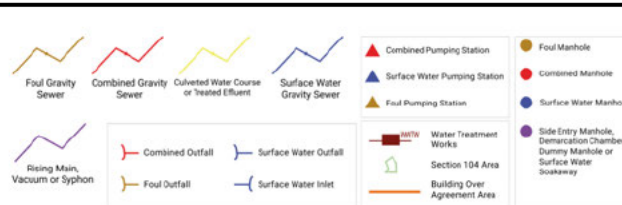


(c) Crown copyright and database rights 2026 Ordnance Survey AC0000808122 Date: 10/06/26 Scale: 1:1250 Map Centre: 508590,115163 Data updated: 22/05/26 Our Ref: 2146075 - 2 Wastewater Plan A4 Powered by digdat

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2026 Ordnance Survey AC0000808122. This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement.



malcolm@easltd.co.uk
Fryern Park



APPENDIX D
UK Sustainable Drainage (UKSUDS) Calculations
(Greenfield Runoff Rate and Infiltration Volume)

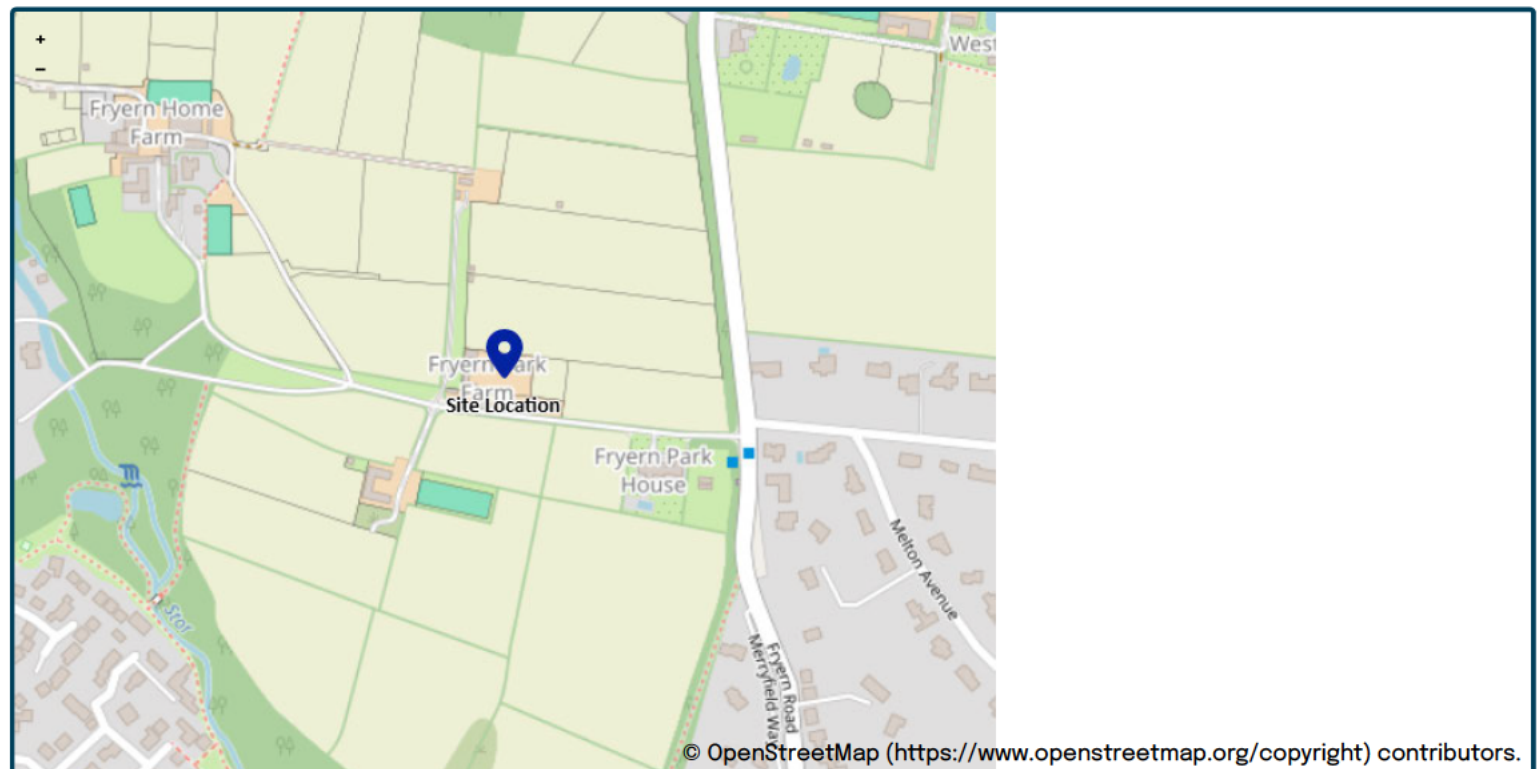
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015).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

Project details

Date	10/06/2026
Calculated by	EAS
Reference	919
Model version	2.2.3

Location

Site name	Fryern Park
Site location	Storrington



Site easting (British National Grid)	508584
Site northing (British National Grid)	115166

Site details

Total site area (ha)	0.43	ha
----------------------	-----------------------------------	----

Greenfield runoff

Method

Method	FEH statistical (2025)
--------	-----------------------------------

FEH statistical (2025)

	<u>My value</u>	<u>Map value</u>
SAAR9120 (mm)	980 mm	
BFIHOST19scaled	0.758	
QMed-QBar conversion	1.136	1.136
QMed (l/s)	0.8 l/s	
QBar (FEH statistical 2025) (l/s)	0.9 l/s	

Growth curve factors

	<u>My value</u>	<u>Map value</u>
Hydrological region	7	7
1 year growth factor	0.85	
2 year growth factor	0.88	
10 year growth factor	1.62	
30 year growth factor	2.3	
100 year growth factor	3.19	
200 year growth factor	3.74	

Results

Method	FEH statistical (2025)
Flow rate 1 year (l/s)	0.7 l/s
Flow rate 2 year (l/s)	0.8 l/s
Flow rate 10 years (l/s)	1.4 l/s
Flow rate 30 years (l/s)	2.0 l/s
Flow rate 100 years (l/s)	2.8 l/s
Flow rate 200 years (l/s)	3.3 l/s

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent ‘zero’ figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.3) developed by HR Wallingford and available at uksuds.com (<https://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 uksuds.com/terms-conditions (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate 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, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.



Infiltration volume design tool

www.uksuds.com | Infiltration volume design tool (<https://www.uksuds.com/>)

This is an estimation of the infiltration volumes and drain-down time to half empty the infiltration system in line with the on CIRIA infiltration drainage R156 guidance (1996) and CIRIA SuDS manual (C753, 2015). This information may be used as the basis for designing an infiltration system for the drainage of surface water runoff from sites.

Project details

Date	10/06/2026
Calculated by	EAS
Reference	919
Model version	2.2.3

Site details

Site name	Fryern Park
Site location	Storrington

Infiltration system

Infiltration system	Soakaway
Type	Ring soakaway with infiltration from sides and base

Geometry, porosity and infiltration

Width (m)	4.8	m
Length (m)	9.6	m
Diameter (m)	2.4	m
Infiltration coefficient (m/s)	0.00000439	m/s
Porosity of fill material	95% eg. High void structure / geocellular structure	
Effective porosity	0.955	

Area to be drained

Total area (m ²)	290.4	m ²
Factor of safety	1.5	

Rainfall

Rainfall input type

FEH22 CSV file

Return period (years)

100

Climate change allowance factor

145%

Results

Soakaway minimum height (m)

0.7

m

Time for half-emptying (hours)

22.8

hours

Critical duration (hours)

12.0

hours

Please note storage volume estimation are subject to uncertainty. Infiltration system height and base area are reported to the nearest 1m or 1m² value when the height or base area are greater than 10m or 10m²; and reported to the nearest to 0.1m or 0.1m² value when the height or base area are less than 10m or 10m².

Disclaimer

This report was produced using the infiltration volume design tool (2.2.3) developed by HR Wallingford and available at [uksuds.com](https://www.uksuds.com) (<https://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 [uksuds.com/terms-conditions](https://www.uksuds.com/terms-conditions) (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate infiltration volumes and drain-down times. 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, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

HR Wallingford are not responsible for any rainfall data shared that is subject to licensing terms imposed by UK Centre for Ecology & Hydrology's Flood Estimation Handbook web service (<https://fehweb.ceh.ac.uk/Home/Terms> (<https://fehweb.ceh.ac.uk/Home/Terms>)).

APPENDIX E: **Output from Drainage Design Software**



MasterDrain
HY 11.0

Environmental Assessment Services Ltd

<http://www.eas ltd.co.uk>

London Rd, Hickstead
Haywards Heath,
West Sussex, RH17 5LZ
Tel: 01444 882552
email: info@eas ltd.co.uk

Job No. 919		
Sheet no. 1		
Date 15/06/26		
By	Checked	Reviewed

Project **Fryern Park**

Title **Hydrological data for STORRINGTON**

Data:-

FSR values

Location = STORRINGTON

Grid reference = TQ0814

M5-60 (mm) = 20.3

SAAR (mm/yr) = 950

r = 0.34

Soil = 0.45

Long reference = 508114

Area = England and Wales

Hydrological area = 7

Hydrological zone = 7

Soil classification for WRAP type 4

Clayey, or loamy over clayey soils with an impermeable layer at shallow depth.

FEH values

c = -0.028

d1 = 0.421

d2 = 0.320

d3 = 0.355

e = 0.316

f = 2.462



Environmental Assessment Services



MasterDrain
HY 11.0

Environmental Assessment Services Ltd

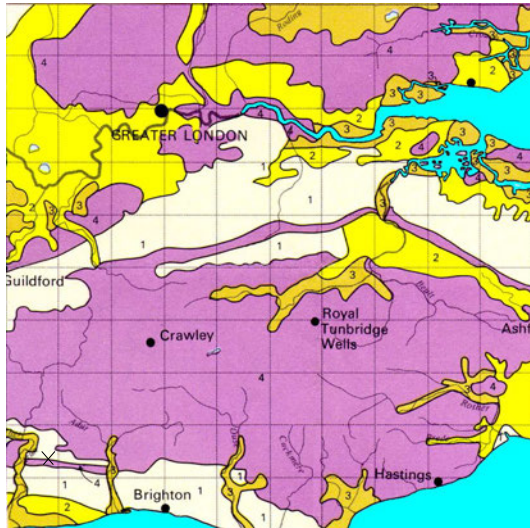
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Job No. 919		
Sheet no. 2		
Date 15/06/26		
By	Checked	Reviewed

Project
Fryern Park

Title
Hydrological data for STORRINGTON



<- Soil

M5-60 ->



<- SAAR

r x 100 ->



Map extracts reproduced by permission of H R Wallingford.



Environmental Assessment Services

Environmental Assessment Services Ltd http://www.easltd.co.uk London Rd, Hickstead Haywards Heath, West Sussex, RH17 5LZ Tel: 01444 882552 email: info@easltd.co.uk		Job No. 919		
		Sheet no. 1		
		Date 29/07/26 10:36		
Project FRYERN PARK		By	Checked	Reviewed
Title Manhole printout for FRYERN PARK				

Manhole ref.	X ref	Y ref	Form	Cham diam. or length	Rect. width	Chamb. height	Shaft height	MH Volume	Exit Diam	Exit Crown	Exit Invert	Chamb const	Slab level	Cover Level	Dwnstr MH
SW1	90.3	3.4	circ	450	N/A	0.50		0.08	100	36.625	36.500	N/A	36.450	37.000	SW2
SW2	76.3	6.8	circ	600	N/A	0.65		0.18	100	36.475	36.350	N/A	36.300	37.000	SOAKAWAY
SW3	52.3	47.9	circ	450	N/A	0.50		0.08	100	35.625	35.500	N/A	35.450	36.000	SW4
SW4	40.3	40.7	circ	600	N/A	0.64		0.18	100	35.485	35.360	N/A	35.310	36.000	SOAKAWAY
SW5	60.2	29	circ	450	N/A	0.50		0.08	100	35.625	35.500	N/A	35.450	36.000	SOAKAWAY

All manholes to be as per 'Sewers for Adoption'

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Job No.
919

Sheet no.
2

Date
29/07/26 10:36

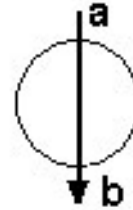
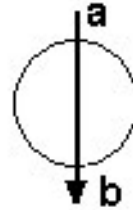
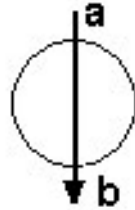
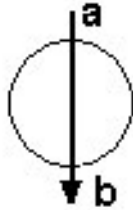
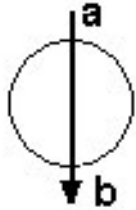
Project
FRYERN PARK

Title
Manhole printout for FRYERN PARK

By

Checked

Reviewed



MH = SW1
a=head
b = 100

MH = SW2
a= 100
b = 100

MH = SW3
a=head
b = 100

MH = SW4
a= 100
b = 100

MH = SW5
a=head
b = 100

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				Sheet no. 3	
				Date 29/07/26 10:36	
Project FRYERN PARK			By	Checked	Reviewed
Title Manhole printout for FRYERN PARK					

These explanatory notes should be read in conjunction with the Manhole printout

- 1) Manhole ref - the reference for the manhole in question
- 2) Form - either circular or rectangular
- 3) Chamber diam or length - diameter of chamber if circular, or length if rectangular - in metres
- 4) Rectangular width - if form is rectangular, this gives the width of the chamber
- 5) Chamber height - height of chamber from invert
- 6) Shaft height - height of access shaft if applicable, from top of chamber to ground level
- 7) Manhole volume - cubic capacity of manhole chamber
- 8) Exit diameter - diameter of pipe leaving this manhole
- 9) Exit crown - crown level of pipe leaving this manhole
- 10) Exit invert - invert level of pipe leaving this manhole
- 11) Chamb const - manhole construction :-
 - N/A - not specified
 - Conc - concrete rings
 - Poly - polypropylene rings surrounded by selected fill
 - Poly/conc - polypropylene rings surrounded by concrete
 - Brick - brick built with waterproof render
 - In situ - concrete cast in situ
- 12) Slab level - surface level of base slab (if no sump, this is placed at 50mm below exit invert to allow levels manipulation).
- 13) Manhole diameters of 9999 have exceeded the sizes available in SfA
- 14) Manhole diameters may have to be modified due to the number of branches



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SW

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Job No. 919		
Sheet no. 1		
Date 29/07/26		
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Project FRYERN PARK			
Title Surcharge calcs for FRYERN PARK CCF = 45%			

Free flowing outlet
Return period = 100 yrs
Climate change factor = 45

PEAK hydrograph values printed
Storm duration = 15 mins
No offline storage

Mean rain intens. 281.00 mm/hr
Storm profile = Summer
Using FEH data

Peak rain intens. 1101.52 mm/hr
Sample period = 7.5 secs.

Entry No.	SECT. No.	MANHOLE REF	PIPE CAPACITY l/s	RATE FLOW l/s	PIPE SIZE mm	CHAMBER DIAM/LxW mm	INVERT LEVEL m	WATER LEVEL m	GRND LEVEL m	SURCHARGE fract.	Depth	EXCESS FLOW l/s	FLOODED VOL m³	DRAINED AREA (m²) :x FACTOR	STATUS	
1	I	1.01	SW1	6.2	6.7	100	450	36.50	36.63	37.00	1.09	0.13	0.55	0.000	50	Surch.
2	I	1.02	SW2	11.7	17.6	100	600	36.35	36.61	37.00	1.50	0.26	5.87	0.000	131	Surch.
3	B	2.01	SW3	6.0	3.8	100	450	35.50	35.56	36.00	0.64	0.06	0.00	0.000	28	OK
4	B	2.02	SW4	6.1	11.6	100	600	35.36	35.61	36.00	1.90	0.25	5.51	0.000	86	Surch.
5	B	3.01	SW5	9.7	7.3	100	450	35.50	35.60	36.00	0.75	0.10	0.00	0.000	54	OK



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Job No. 919		
Sheet no. 2		
Date 29/07/26		
By	Checked	Reviewed

Project FRYERN PARK			
Title Surcharge calcs for FRYERN PARK CCF = 45%			

Notes

Printout headings

- | | | |
|---|---|--|
| 1) Entry no - position in file | 2) Section no - pipe identifier | 3) Manhole ref - Manhole identifier |
| 4) Pipe cap - full bore capacity of that pipe | 5) Rate of flow - calculated flow rate (l/s) ± = flow restrictor. | 6) Pipe diam - outlet pipe diameter (mm) |
| 7) Chamber diam - chamber diam. at base of MH | 8) Invert level - invert level of manhole | 9) Water level - calculated peak water level. |
| 10) Grnd level - ground / cover level | 11) Surch. fract - calc.flow/pipe capacity | 12) Surch. depth - surcharge level above soffit |
| 13) Overflow - surcharged flow rate (l/s) | 14) Flooded vol - volume of water above cover | 15) Upstrm Vol - upstream pipe vol to previous manhole(s) |
| 16) Status - OK - outlet not surcharged | 17) Status - Surcharged - outlet surcharged | 18) Status - Warning - water level within 299mm of cover level |
| 19) Status - Flooded - cover over-topped | 20) § against diameter indicates throttle pipe used. | |

Title box

Hydrograph data

- | | | |
|---|--------------------------------------|--|
| 1) Ret. period - that used to calculate profile | 2) Duration - length of storm (mins) | 3) Profile - either Winter (75%) or Summer (50%) |
|---|--------------------------------------|--|



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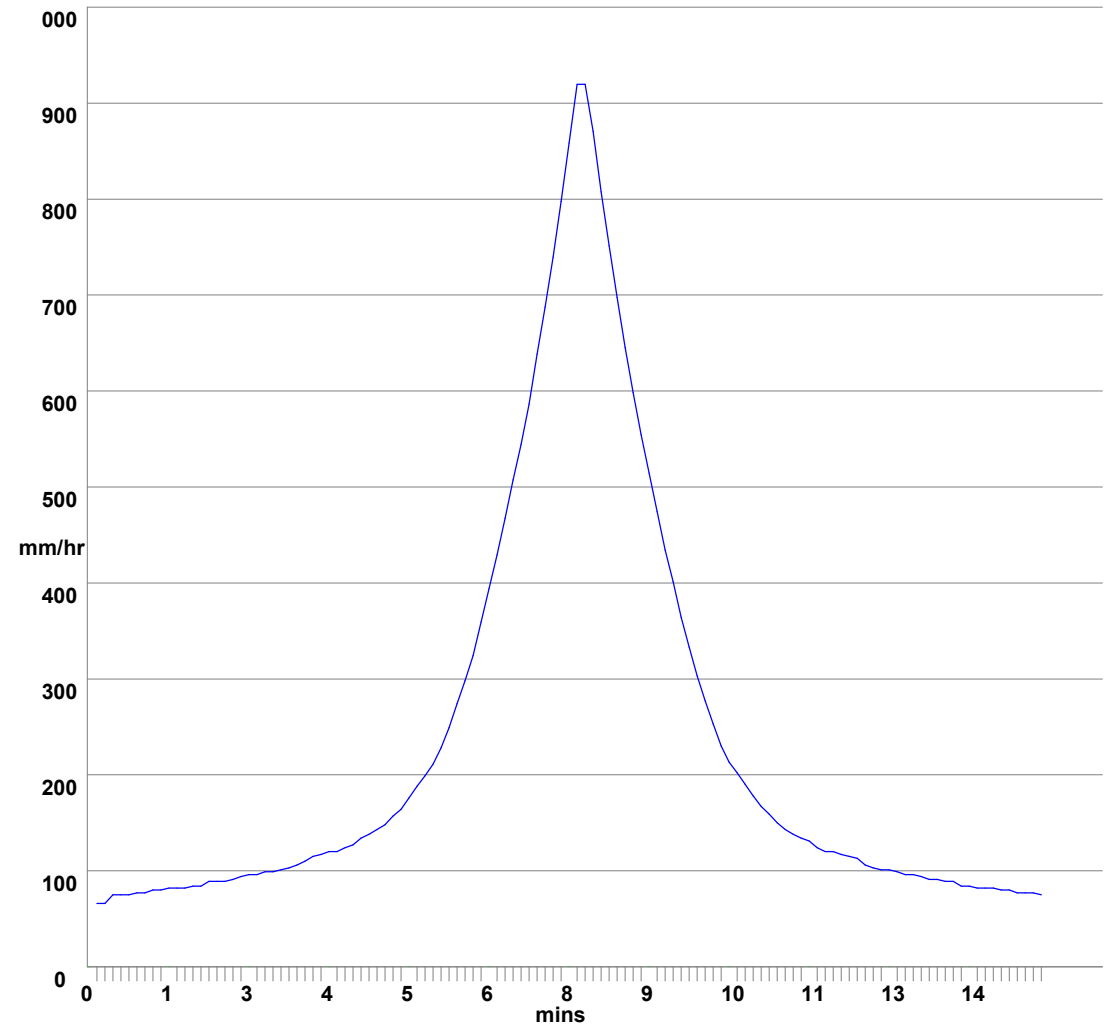
Project
FRYERN PARK

Title
Surcharge calcs for FRYERN PARK CCF = 45%

Time mins	Rain mm/hr	Time mins	Rain mm/hr	Time mins	Rain mm/hr
0:08	65.67	5:08	187.64	10:08	201.71
0:15	65.67	5:15	199.37	10:15	189.99
0:22	75.06	5:22	211.10	10:22	178.26
0:30	75.06	5:30	227.52	10:30	166.53
0:38	75.06	5:38	248.63	10:38	159.50
0:45	77.40	5:45	274.43	10:45	150.11
0:52	77.40	5:52	297.88	10:52	143.08
1:00	79.75	6:00	323.68	11:00	138.39
1:08	79.75	6:08	358.86	11:08	133.69
1:15	82.09	6:15	394.05	11:15	131.35
1:22	82.09	6:22	429.23	11:22	124.31
1:30	82.09	6:30	466.76	11:30	119.62
1:38	84.44	6:38	506.63	11:38	119.62
1:45	84.44	6:45	544.16	11:45	117.28
1:52	89.13	6:52	586.38	11:52	114.93
2:00	89.13	7:00	637.98	12:00	112.58
2:08	89.13	7:08	687.24	12:08	105.55
2:15	91.48	7:15	738.84	12:15	103.20
2:22	93.82	7:22	797.48	12:22	100.86
2:30	96.17	7:30	858.46	12:30	100.86
2:38	96.17	7:38	919.44	12:38	98.51
2:45	98.51	7:45	919.44	12:45	96.17
2:52	98.51	7:52	870.19	12:52	96.17
3:00	100.86	8:00	806.86	13:00	93.82
3:08	103.20	8:08	750.57	13:08	91.48
3:15	105.55	8:15	696.62	13:15	91.48
3:22	110.24	8:22	645.02	13:22	89.13
3:30	114.93	8:30	598.11	13:30	89.13
3:38	117.28	8:38	553.54	13:38	84.44
3:45	119.62	8:45	513.67	13:45	84.44
3:52	119.62	8:52	473.80	13:52	82.09
4:00	124.31	9:00	433.92	14:00	82.09
4:08	126.66	9:08	401.08	14:08	82.09
4:15	133.69	9:15	363.56	14:15	79.75
4:22	138.39	9:22	333.06	14:22	79.75
4:30	143.08	9:30	302.57	14:30	77.40
4:38	147.77	9:38	276.77	14:38	77.40
4:45	157.15	9:45	253.32	14:45	77.40
4:52	164.19	9:52	229.86	14:52	75.06
5:00	175.91	10:00	213.44	15:00	75.06

Hydrograph profile derived from data in the Flood Studies Report

Return period= 100 yrs Duration= 15 mins Profile - summer





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SW

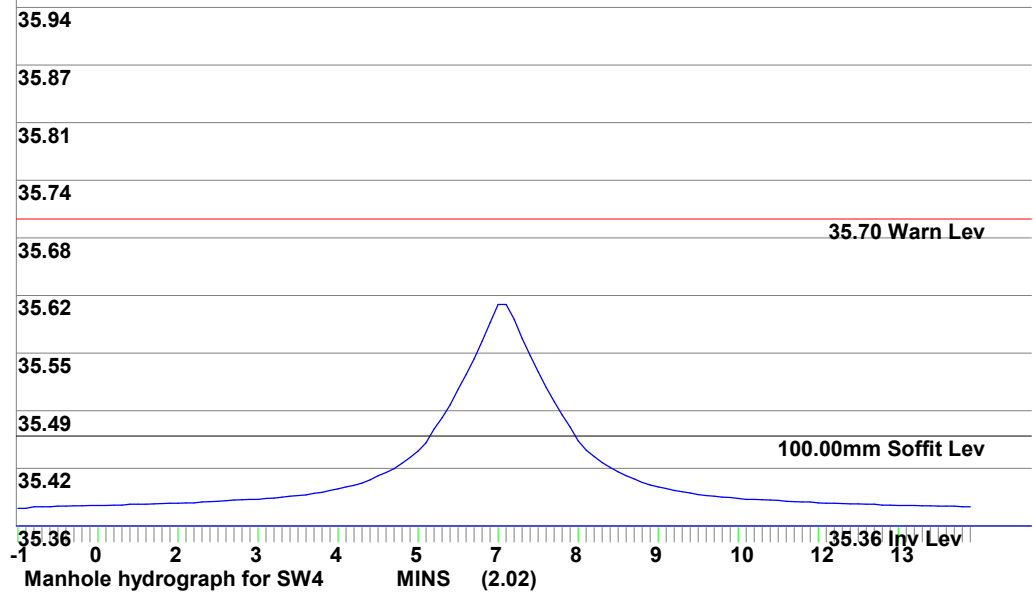
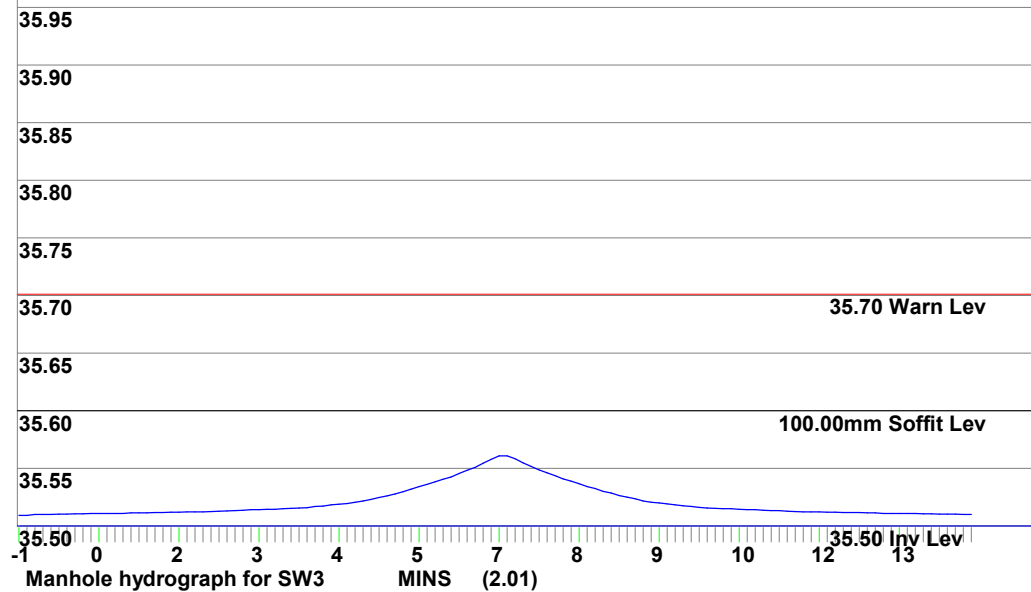
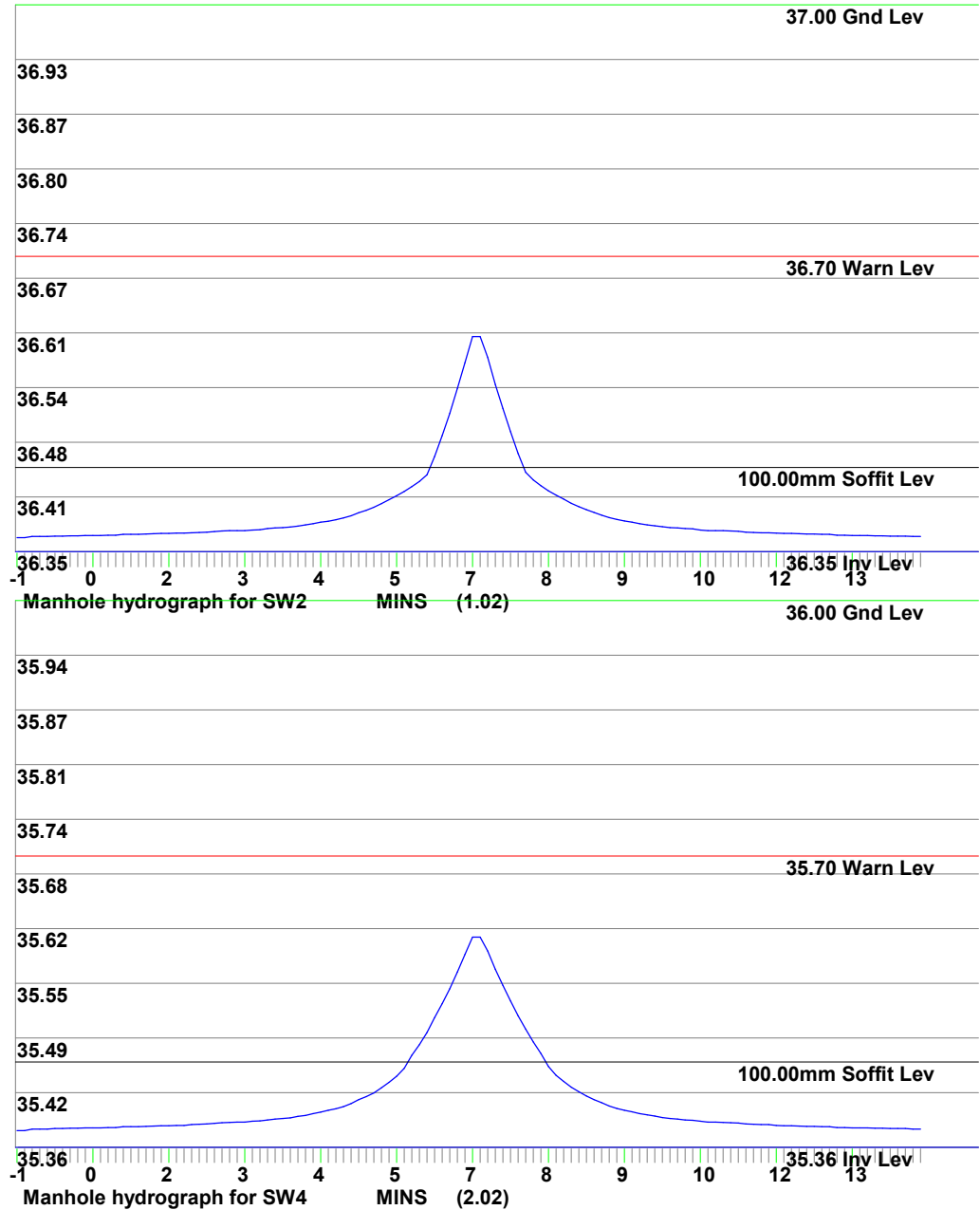
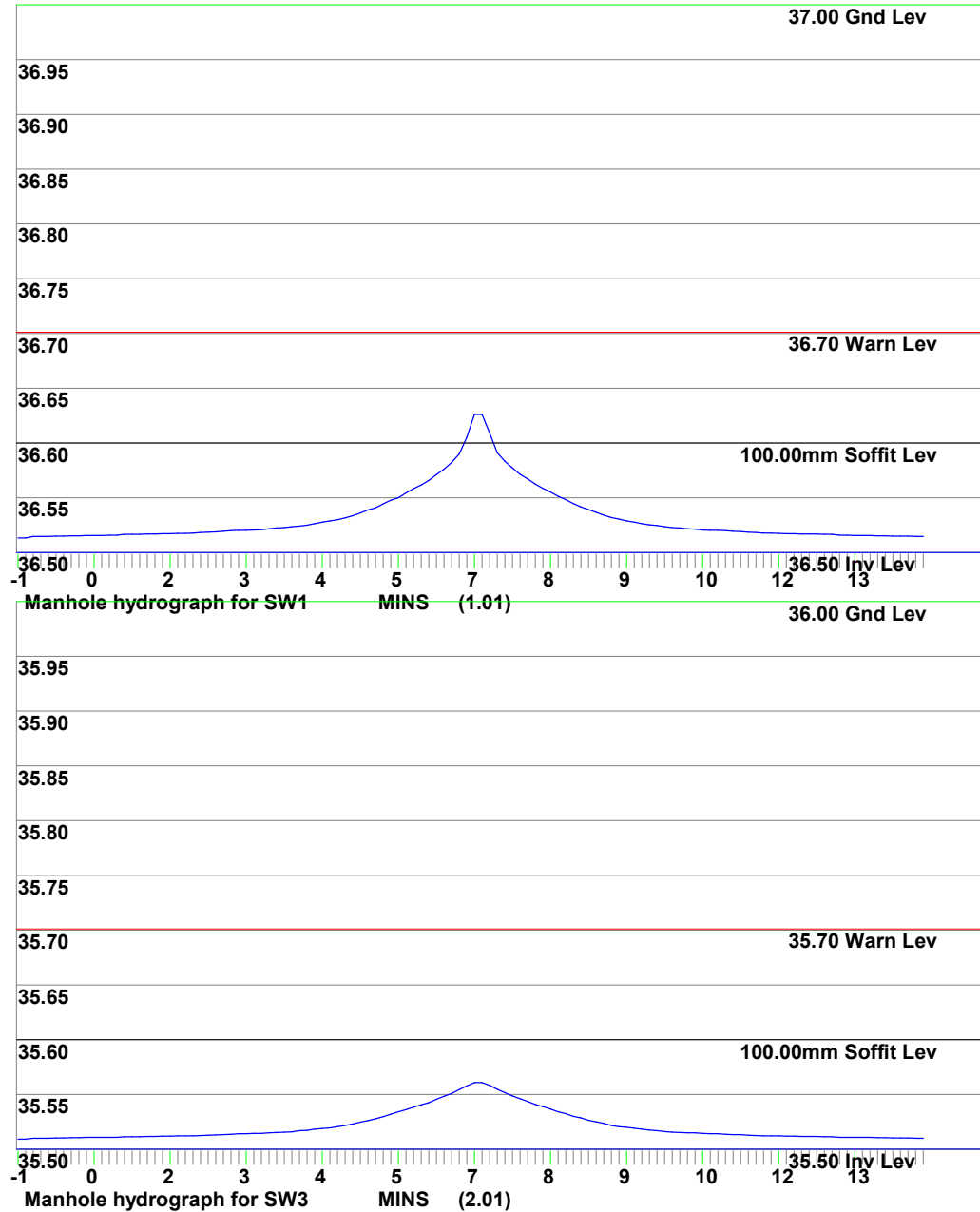
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Project FRYERN PARK	By	Checked	Reviewed
Title Surcharge calcs for FRYERN PARK CCF = 45%			





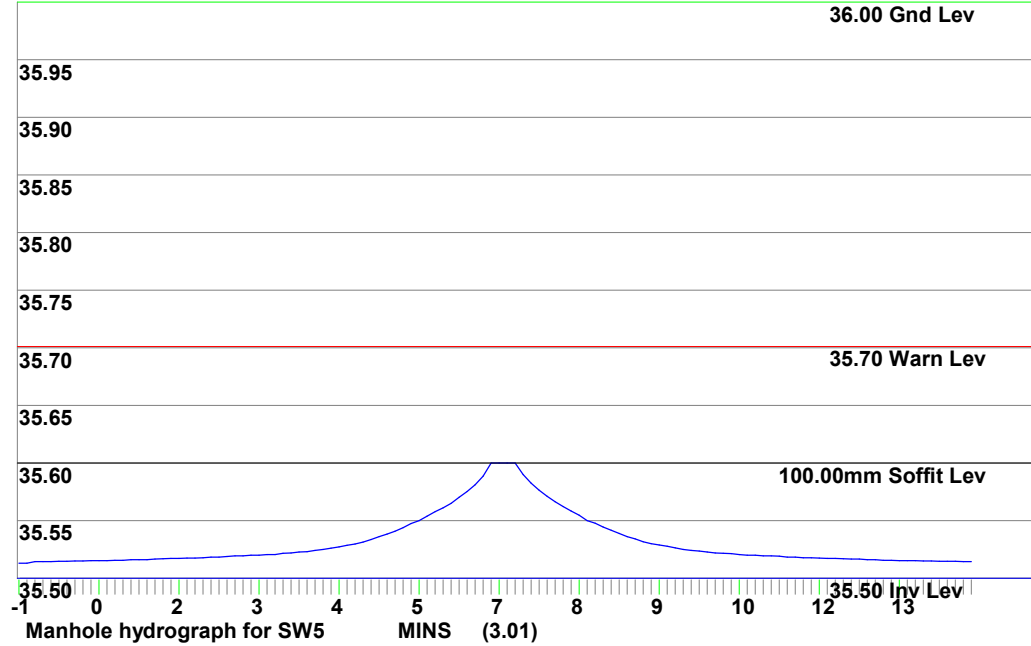
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Project FRYERN PARK	By	Checked	Reviewed
Title Surcharge calcs for FRYERN PARK CCF = 45%			





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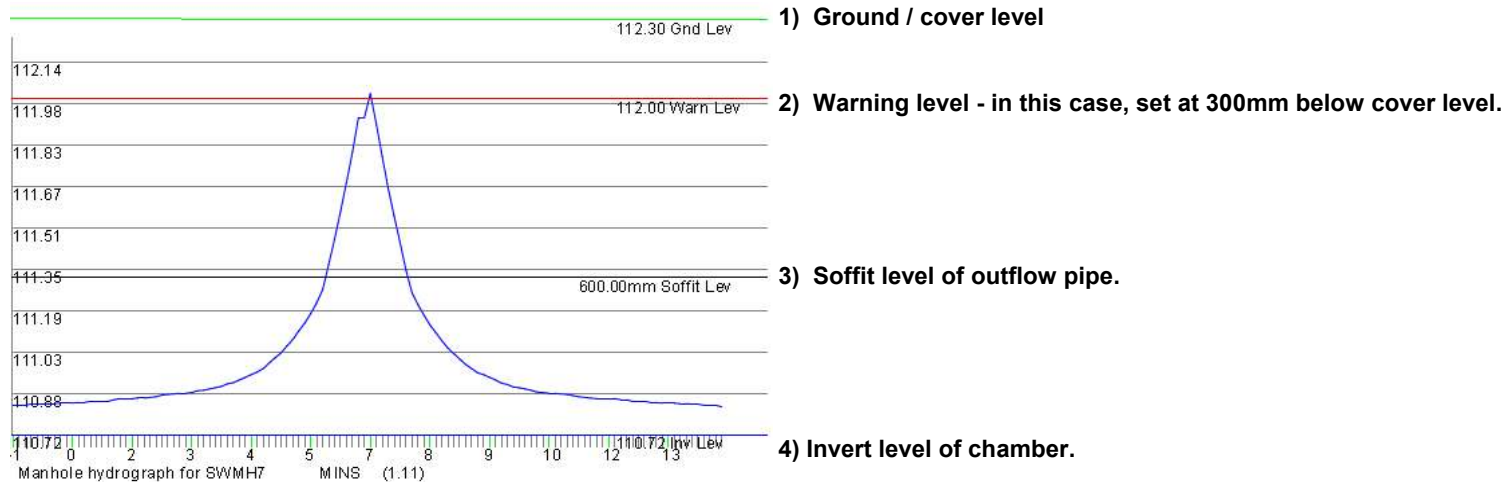
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Project
FRYERN PARK

Title
Surcharge calcs for FRYERN PARK CCF = 45%



Notes

- Lower section of the graph shows the water depth filling the channel. Channel is assumed to be a full pipe diameter in depth.
- Upper section of the graph shows the water depth filling the chamber. Chamber has a greater width/diameter than the channel, so increases in depth are proportionally less.
- The top of the graph clips the warning level and would be marked thus on the printout.
- In many cases the invert of the offline storage is required to enter at the channel soffit level, meaning that the pipe will still surcharge but flooding risk reduced.
- The diagram above is a general one and is not part of the current calculation.



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Foul 11.5

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Project **FRYERN PARK**
Title **Manhole printout for FRYERN PARK**

Manhole ref.	Form	Cham diam. or length	Rect. width	Chamb. height	Shaft height	MH Volume	Ent. Diam	Ent. Crown	Ent. Invert	Exit Diam	Exit Crown	Exit Invert	Chamb const	Cover Level	Dwnstr MH
FW1	circ	450	N/A	0.50		0.08	Head	----	----	100	35.625	35.500	N/A	36.000	FW2
FW2	circ	450	N/A	0.67		0.11	100	0.000	0.000	100	35.455	35.330	N/A	36.000	STP
FW3	circ	450	N/A	0.50		0.08	Head	----	----	100	35.625	35.500	N/A	36.000	FW4
FW4	circ	450	N/A	0.77		0.12	100	0.000	0.000	100	35.355	35.230	N/A	36.000	STP
FW5	circ	450	N/A	0.50		0.08	Head	----	----	100	35.625	35.500	N/A	36.000	STP
STP	circ	1200	N/A	0.50		0.57	100	0.000	0.000	100	34.625	34.500	N/A	35.000	AGE FIELD

All manholes to be as per 'Sewers for Adoption'

Levels calculated for level inverts



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Foul 11.5

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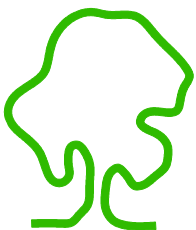
Job No. 919		
Sheet no. 0		
Date 29/07/26		
By	Checked	Reviewed

Project
FRYERN PARK

Title
Manhole printout for FRYERN PARK

These explanatory notes should be read in conjunction with the Manhole printout

- 1) Manhole ref - the reference for the manhole in question
- 2) Form - either circular or rectangular
- 3) Chamber diam or length - diameter of chamber if circular, or length if rectangular - in metres
- 4) Rectangular width - if form is rectangular, this gives the width of the chamber
- 5) Chamber height - height of chamber from invert
- 6) Shaft height - height of access shaft if applicable, from top of chamber to ground level
- 7) Manhole volume - cubic capacity of manhole chamber
- 8) Exit diameter - diameter of pipe leaving this manhole
- 9) Exit crown - crown level of pipe leaving this manhole
- 10) Exit invert - invert level of pipe leaving this manhole
- 11) Manhole diameters of 9999 have exceeded the sizes available in Sfa
- 12) Manhole diameters may have to be modified due to the number of branches



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