



SURFACE WATER DRAINAGE STRATEGY

COTE LANE THURGOLAND

PROPOSED RESIDENTIAL DEVELOPMENT OF 24 DWELLINGS

MAR 2016

JOB REFERENCE: 50659

SURFACE WATER DRAINAGE STRATEGY

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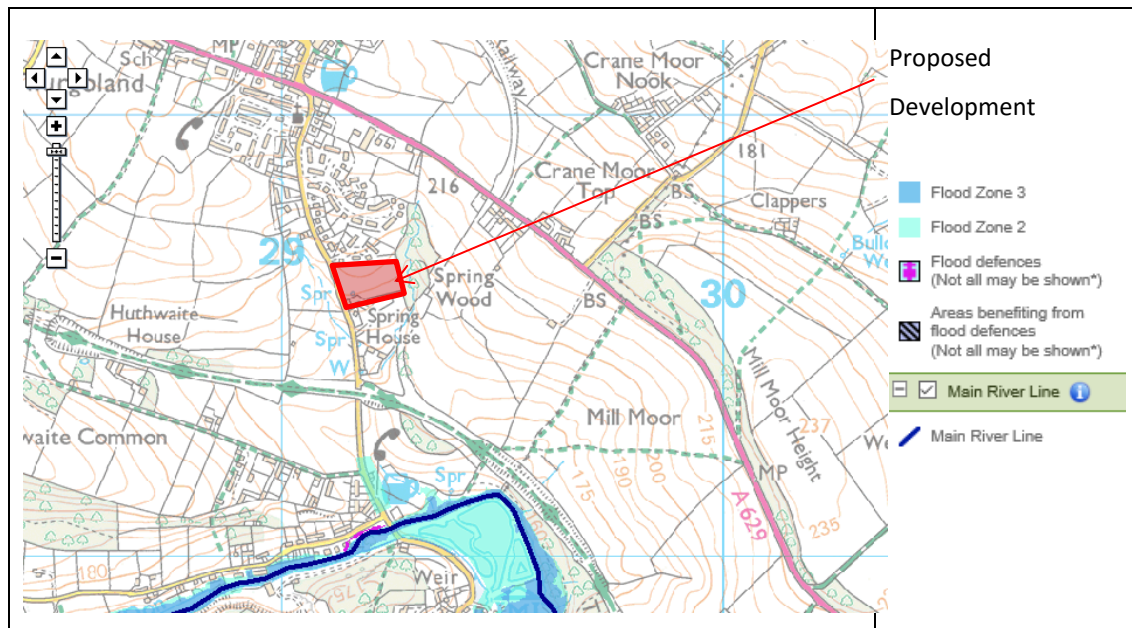
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1.0 Introduction

- 1.1 AAH Planning Consultants have been commissioned to undertake a Drainage Assessment of the planning application to erect 24 new residential dwellings on Cote Lane, Thurgoland, 14km north of Sheffield and 1100m east of the River Don.
- 1.2 The development site is in an area broadly classified by the Environment Agency as Flood Zone 1, the low flood risk area, and has a plan area of 9900m². The site is under the jurisdiction of Barnsley Metropolitan Borough Council and Yorkshire Water. In accordance with Table 2 of the National Planning Policy Framework Technical Guidance (NPPF TG), the existing site, as land and buildings used for agriculture, is considered 'water compatible'. The new C3 use class residential dwellings are classified as 'more vulnerable'. Therefore, the vulnerability of the site is considered to increase as a result of the development.
- 1.3 This report concludes that the site is at a low risk of flooding from fluvial, tidal, pluvial, groundwater and artificial sources based upon a qualitative assessment of existing data. Site levels are referenced to ordnance datum and taken from the Existing Site Plan March 2016. The Existing Site Plan is attached to this document in Appendix A, with the Indicative Layout plans in Appendix B, attenuation calculations in Appendix C and Yorkshire Water Network Enquiry in Appendix D.
- 1.4 The surface water drainage strategy for the site identifies that the most appropriate means for surface water disposal would be via attenuation and the existing 150mm diameter storm sewer which runs down the east side of Cote Lane and discharges to a watercourse 40m from the site. Foul water disposal would be to the existing 300mm combined sewer which runs down the west side of Cote Lane.

2.0 Existing Site

- 2.1 The proposal site is located in the village of Thurgoland, 10km north of Sheffield and 4.8km west of the M1. The nearest post code is S35 7AE, and the approximate OS grid reference is SE291006.
- 2.2 The topographic survey in Appendix A indicates that existing ground levels rise from 185.80mAOD in the southeast corner to 195.50mAOD on the northern boundary, so the site and the prevailing topography falls generally from north to south. The plot is rectangular pastureland, and 9900m² in plan area. A number of ordinary watercourses exist in the general vicinity of the site and serve to drain surface water from the area.
- 2.3 The EA flood map indicates the site is in Flood Zone 1, an area at less than 0.1% risk of flooding. There are a number of ordinary watercourses in the general vicinity of the site which drain surface water within the area.



- 2.4 In planning terms, the plot is agricultural land and buildings, and in accordance with Table 2 of the National Planning Policy Framework Technical Guidance, classified as 'water compatible'.

3.0 Development Proposal

3.1 The proposed planning application seeks to obtain planning consent for a new residential development of 24 dwellings across the existing site.



3.2 The proposed dwellings on the site will require vehicular and pedestrian access on to Cote Lane. The site layout according to surface is 20% dwellings, 20% access road and driveways and the remaining 60% formed by soft landscaping.

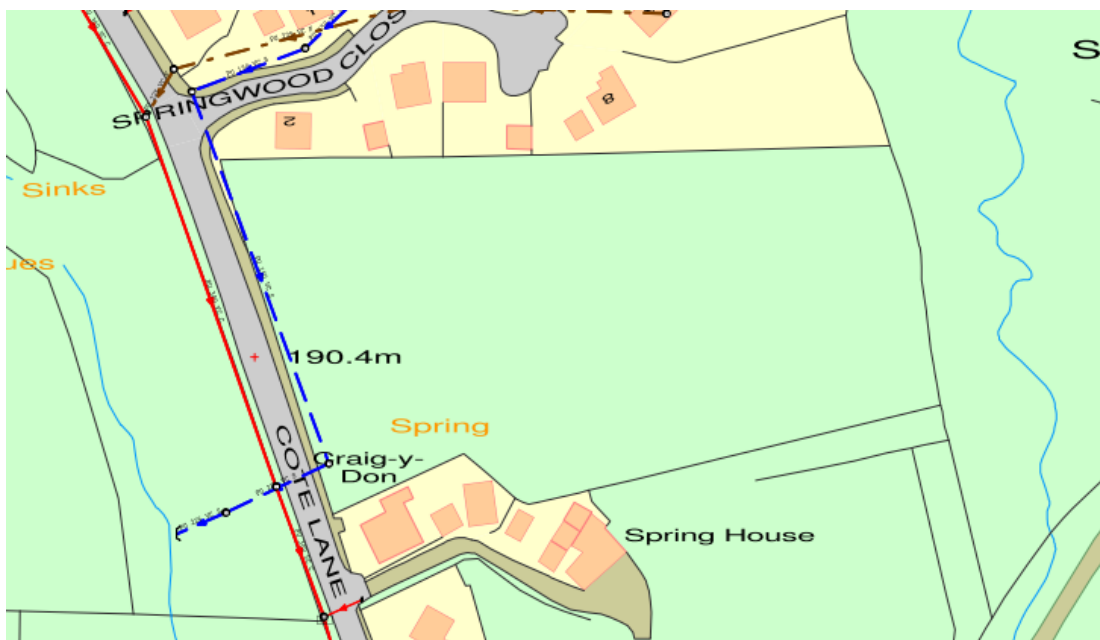
Surface Areas ha			
	Impermeable	Permeable	Total
Pre-development	0	0.99	0.99
Post-development	0.19 dwellings 0.20 Roads	0.60	0.99

3.3 The Indicative Layout Plan is shown in Appendix B.

4.0 Drainage Assessment

- 4.1 The sustainable management surface water is a fundamental component of the outline planning consideration. The proposed development should not increase, and where possible, should reduce the risk of flooding to downstream properties. In accordance with the sustainable hierarchy contained in the NPPF preference would be for source control of runoff via infiltration systems, then discharge to an open watercourse, a surface water sewer or a combined sewer - in that order of preference.
- 4.2 Barnsley Metropolitan Borough Council (BMBBC) Core Strategy Policies (CSP) 3 & 4 require SuDS/Foul & Surface Water Drainage Details for Major Developments. All new development will be expected to use Sustainable Drainage Systems (SuDS) unless it can be demonstrated that SuDS are impractical. The drainage details should include an assessment to demonstrate how proposed SuDS would work and be maintained and include measures to avoid water contamination and safeguard groundwater supply.
- 4.3 If SuDS are not possible the details should include a statement explaining why. If an application proposes to connect a development to an existing drainage system then details of the existing system should be shown on the application drawings. It should be noted that in most circumstances surface water is not permitted to be connected to the public foul sewers.
- 4.4 Where the development involves the disposal of foul sewage effluent other than to the public sewer, a foul drainage assessment will be required. A foul drainage assessment should include a full assessment of the site, its location and suitability for storing, transporting and treating sewage. Where connection to the mains sewer is not practical, then the foul/non-mains drainage assessment will be required to demonstrate why the development cannot connect to the public mains sewer system and show that the alternative means of disposal are satisfactory.
- 4.5 Reference to the BGS website indicates that the site is underlain by Penistone Flags Sandstone and Pennine Lower Coal Measures Formation mudstone, siltstone and sandstone. There is no recorded superficial geology, and no nearby borehole records, so in the absence of field testing, it has been assumed that infiltration is not viable as a means of storm water disposal.

- 4.6 There are watercourses to the east and west of the site, each less than 40m from the site. Under normal circumstances, preference would be given to discharge to an open watercourse should this be possible. In this situation, however, the site is connected to the western watercourse by a short (<40m) length of 150mm diameter storm water sewer. It is thought likely therefore that preference would be given to a connection to this sewer in order to facilitate crossing Cote Lane, assuming that sufficient capacity is available. This is illustrated in the extract from the Yorkshire Water Network Enquiry below (the full drawing, with key, is in appendix D):

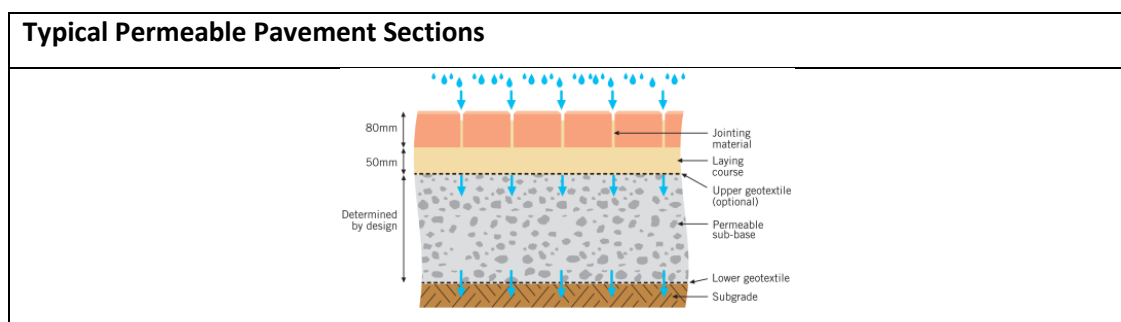


Permeable Paving

- 4.7 Permeable paving is approved by many local authorities for implementation on the development road network and can act as a receptor for surface water run-off from nearby house roofs. However, the system is perhaps best suited to managed parking areas and shared surfaces where block paving is typically used as the surface treatment and ongoing maintenance can be ensured by way of a management company or the like. There is little need for underground pipes or gullies, and the attenuation afforded within the sub-base layer helps to reduce the volume of storage required elsewhere.
- 4.8 The proposal could incorporate permeable pavements in the private driveways and hardstanding areas which could be left as an open system to allow infiltration and so constitute source control of runoff. No additional drainage of these areas is required in

accordance with SuDS principles. Permeable hardstandings would also provide initial interception storage of the first 5mm of rainfall prior to infiltration through the hardstanding surface and into the underlying sub base.

- 4.9 A typical pervious pavement would comprise permeable block work paving with a 10-63mm clean crushed stone lower sub-base type material (BS EN 13242:2002) with a fill depth of circa 150mm. This angular material has greater interlocking properties which aid structural stability and increase porosity. A 150mm sub base depth would provide sufficient capacity to contain a 45mm rainfall depth without any consideration for infiltration. It is unlikely that pervious pavements will be used for roadways which may be subject to adoption.



Attenuation Drainage Systems

- 4.10 Attenuation drainage systems collect partially treated, excess water from the primary source control systems at a local level, thereafter providing both water quality attenuation and flow conveyance through the site towards the main outfall. The basins will normally be dry with permanently wet low flow channels to convey run-off in periods of low rainfall.

Ditches

- 4.11 Ditches may be used along highways and in common areas to infiltrate, attenuate and convey flows from hard surfaces across the development before being discharged in to the secondary system. Linear features, such as ditches and filter strips provide an efficient means of improving water quality.

Preliminary Drainage Proposals

- 4.12 Preliminary assessments of the requirements for storm drainage have been based on the following criteria:

Application Site Area 9900m²

Sewer flood protection: 1 in 30 years
Fluvial / Development flood protection: 1 in 100 years

M5-60 20.0mm **SAAR** 817
Ratio r 0.30 **WRAP** 2

Minimum cover to sewers (m): 1.2
Minimum velocity (m/s): 1.0
Pipe ks value (mm): 0.6mm
Allowance for Climate Change: 30%

4.13 It is estimated that of the 9900m² site approximately 20% or 1900m² would comprise dwellings, 20% or 2000m² roads or driveways, whilst 60% or 6000m² would be undeveloped soft landscaping.

Site Areas m ²	Impermeable	Permeable	Total
Pre-development	0	9900	9900
Post development	3900	6000	9900

4.14 Based on IoH 124 Greenfield run-off rates have been assessed for the site from the equation:-

Runoff is calculated from:-

$$Q_{\text{BAR(rural)}} = 0.00108 \text{ AREA}^{0.89} \cdot \text{SAAR}^{1.17} \cdot \text{SOIL}^{2.17}$$

where

AREA = Site area in Km²
SAAR = Standard Average Annual Rainfall (mm/yr)
SOIL = Soil value derived from Winter Rainfall Acceptance Potential
Q_{BAR(rural)} = Runoff (cumecs)

Q_{BAR(rural)} is then multiplied by a growth factor - GC(T) - for different storm return periods derived from EA publication W5-074/A.

4.15 Attenuation volumes have been calculated for a range of allowable discharge rates, and supporting calculations are provided in Appendix C. The drainage system proposed will be designed to accommodate rainfall events up to and including the 1 in 100 year plus 30% climate change allowance.

Allowable runoff rate (l/s)	Attenuation volume required (m ³)
2.16	231
4.54	175
5.0	169

- 4.16 BMBC has confirmed that they would accept an allowable runoff rate of 5l/s/ha. Therefore, assuming a limiting discharge rate of 5.0l/s and a 3900m² built footprint, 169m³ of storage would be required for the 1 in 100 year plus climate change storm.
- 4.17 The proposal would incorporate attenuation storage in the open space to the west of the site. Existing ground levels are 188.06mAOD. Assuming an available depth of 1200mm, this could be accommodated in crate storage of 15.0m by 10.0m, from where it will discharge into the existing storm sewer. This could also be stored in an open basin, depending on the final layout. Indicative storm water attenuation calculations are attached in Appendix C of this report, and the attenuation storage location shown in Appendix B.
- 4.18 The detailed design stage will provide further information on the positioning of overflows and direction of flow.

Implementation Proposals

- 4.19 The conceptual drainage proposals have been developed in a manner that will allow the system to be designed to encourage passive treatment of discharged flows and to improve the water quality by removing the low level silts, oils and metal associated with urban runoff. Final design will provide for appropriate geometry and planting to maximise this benefit. The storm water management features will be constructed and operational for each phase of the build programme.
- 4.20 The storm water management features will also be designed to enhance the biodiversity and landscape character of the site, while providing amenity space and a functional feature to control storm discharges.

Detailed Drainage Design

- 4.21 At the planning stage, the surface water drainage advice contained in this report is conceptual and used as a means to demonstrate that the sustainable drainage of the site is achievable in principle. Therefore, although it is anticipated that the general concepts contained in the surface water drainage strategy section of this report will be adhered to and comply with current best practice, the finite detail may be subject to change depending upon the final drainage design which should be conditioned on the approved planning decision notice and undertaken as part of the Building Regulations Part H assessment.

Foul Sewage Disposal

- 4.22 Disposal of foul sewage effluent will be to the 300mm diameter combined sewer running along the far side of Cote Lane. All foul water drainage would connect to the manhole chamber opposite Spring House. Preference would be for a gravity driven or pumped outfall in that order of preference, dependent on sewer invert level which is to be confirmed by survey. A sewer survey, combined with a capacity check of the surveyed section may be required prior to connection.

5.0 Conclusion

- 5.1 The proposed development would seek to erect 24 new residential dwellings on Cote Lane, Thurgoland, 14km north of Sheffield and 1100m east of the River Don. The site lies within an area classified as Flood Zone 1, the low fluvial flood risk area. Flood zone 1 is typically considered to have an annual risk of flooding from fluvial (rivers) and tidal sources less than 0.1% on average in any given year.
- 5.2 The drainage design of the development would be conditioned at the planning stage, and undertaken during the building regulations assessment. This would be agreed with the statutory consultees prior to further building works, however at this stage it appears that the use of below ground 169m³ attenuation storage systems with discharge to existing storm sewer would be the most appropriate means of surface water disposal.
- 5.3 The proposal therefore complies with the requirements of NPPF and should be granted planning consent from this perspective.

APPENDIX A

SITE LOCATION/TOPOGRAPHIC SURVEY

APPENDIX B

PROPOSED SITE PLANS



15m by 10m Attenuation Storage.

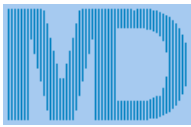
Recreation Open Space

Cote Lane, Thurgoland Indicative Layout

March 2016
Dwg no. 2467.002
Scale 1:1250 @ A4

APPENDIX C

SURFACE WATER DRAINAGE CALCULATIONS



AAH Planning Consultants

http://www.aahplanning.com/

2 Bar Lane,
York,
YO1 6JU
Tel: (01904) 780955
email: admin@aaahplanning.com

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Project	Thurgoland
Title	Peak flow storage calcs for Thurgoland

Data:-

FSR Hydrology:-

Location	= Thurgoland	Grid reference	= SE2900
M5-60 (mm)	= 20	r	= 0.30
Soil index	= 0.30	SAAR (mm/yr)	= 817
Return period	= 100	WRAPx	= 2
UCWI	= 85.8		

- i) Very permeable soils with shallow ground water;
- ii) Permeable soils over rock or fragipan, commonly on slopes in western Britain associated with smaller areas of less permeable wet soils; The layer is low in organic matter, mottled and (fragipan - a natural subsurface horizon having a higher bulk density than the solum above. Seemingly cemented when dry but showing moderate to weak brittleness when moist. Slowly or very slowly permeable to water. It is found in profiles of either cultivated or virgin soils but not in calcareous material).
- iii) Moderately permeable soils, some with slowly permeable subsoils.

Runoff factor (RF) = 77.0, calculated from:-

Runoff factor = $(0.829 \times \text{PIMP}) + (25 \times \text{SOIL}) + (0.078 \times \text{UCWI}) - 20.7$
 where
 $\text{PIMP} = \text{Impervious Area} \times 100 / (\text{Impervious Area} + \text{Pervious Area})$
 $\text{UCWI} = \text{Calculated value for Wetness Index}$

Design data:-

Imperv. area	= 3900 m ²	Pervious area	= 0 m ²
Total area (TA)	= 3900 m ²	Equiv area	= 3003 m ² (TA x RF) .
Discharge to drain	= 5.000 l/s	Areal reduction factor	= 1.000
Additional flow	= 0.00 l/s	Climate change factor	= 30

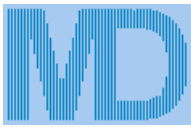
Calculated data:-

Time to max	= 221.0 mins	Calculated storage volume	= 169.0 m ³
Rainfall at max	= 21.55 mm/hr	Discharge rate per Ha	= 12.82 l/s/Ha
Pipeline storage	= 0.0 m ³	Available MH storage	= 0.0 m ³
Offline storage	= 0.0 m ³		

Rainfall intensities calculated using the Wallingford Procedure

Storage lengths for initial calculation (x 1.1, 1.2, 1.3 or 1.5 as above if required) :-

Diam	Len	Diam	Len	Ovoid	Len	Box culvert	Len
100	21523.0	1125	170.1	400 x 600	938.9	500 x 500	676.0
150	9565.8	1200	149.5	600 x 900	408.8	500 x 750	450.7
225	4251.5	1275	132.4	800 x 1200	229.9	500 x 1000	338.0
300	2391.4	1350	118.1			750 x 1000	225.3
375	1530.5	1425	106.0			750 x 1200	187.8
450	1062.9	1500	95.7			750 x 1500	150.2
525	780.9	1575	86.8			1000 x 1000	169.0
600	597.9	1650	79.1			1000 x 1200	140.8
675	472.4	1725	72.3			1000 x 1500	112.7
750	382.6	1800	66.4			1000 x 1800	93.9
825	316.2	1875	61.2			1000 x 2000	84.5
900	265.7	1950	56.6			1500 x 1500	75.1
975	226.4	2025	52.5			1500 x 1800	62.6
1050	195.2	2100	48.8			1500 x 2000	56.3



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Consultants**

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2 Bar Lane,
York,
YO1 6JU
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Data:-

Time (mins)	Rain mm/hr	Inflow (m3)	Outflow (m3)	Balance (m3)
10	140.0	69.087	3.000	66.087
20	100.0	98.869	6.000	92.869
30	80.0	118.557	9.000	109.557
40	68.0	133.561	12.000	121.561
50	59.0	145.769	15.000	130.769
60	53.0	156.091	18.000	138.091
70	48.0	165.042	21.000	144.042
80	44.0	172.943	24.000	148.943
90	40.0	180.008	27.000	153.008
100	38.0	186.392	30.000	156.392
110	35.0	192.205	33.000	159.205
120	33.0	197.534	36.000	161.534
130	32.0	202.445	39.000	163.445
140	30.0	206.991	42.000	164.991
150	29.0	211.215	45.000	166.215
160	27.0	215.153	48.000	167.153
170	26.0	218.834	51.000	167.834
180	25.0	222.284	54.000	168.284
190	24.0	225.524	57.000	168.524
200	23.0	228.750	60.000	168.750
210	22.0	231.939	63.000	168.939
220	22.0	235.009	66.000	169.009
230	21.0	237.969	69.000	168.969
240	20.0	240.828	72.000	168.828
250	20.0	243.594	75.000	168.594
260	19.0	246.272	78.000	168.272
270	19.0	248.869	81.000	167.869
280	18.0	251.390	84.000	167.390
290	18.0	253.841	87.000	166.841
300	17.0	256.224	90.000	166.224
310	17.0	258.545	93.000	165.545
320	16.0	260.806	96.000	164.806
330	16.0	263.012	99.000	164.012
340	16.0	265.165	102.000	163.165
350	15.0	267.268	105.000	162.268
360	15.0	269.323	108.000	161.323
370	15.0	271.332	111.000	160.332
380	15.0	273.299	114.000	159.299
390	14.0	275.224	117.000	158.224
400	14.0	277.111	120.000	157.111
410	14.0	278.959	123.000	155.959
420	14.0	280.772	126.000	154.772
430	13.0	282.551	129.000	153.551
440	13.0	284.297	132.000	152.297
450	13.0	286.011	135.000	151.011
460	13.0	287.694	138.000	149.694
470	12.0	289.349	141.000	148.349
480	12.0	290.975	144.000	146.975
490	12.0	292.574	147.000	145.574
500	12.0	294.148	150.000	144.148
510	12.0	295.696	153.000	142.696
520	12.0	297.220	156.000	141.220
530	11.0	298.720	159.000	139.720
540	11.0	300.198	162.000	138.198
550	11.0	301.654	165.000	136.654
560	11.0	303.088	168.000	135.088
570	11.0	304.502	171.000	133.502
580	11.0	305.896	174.000	131.896
590	11.0	307.271	177.000	130.271
600	10.0	308.628	180.000	128.628

Storage volume (m³) = 169.0 m³



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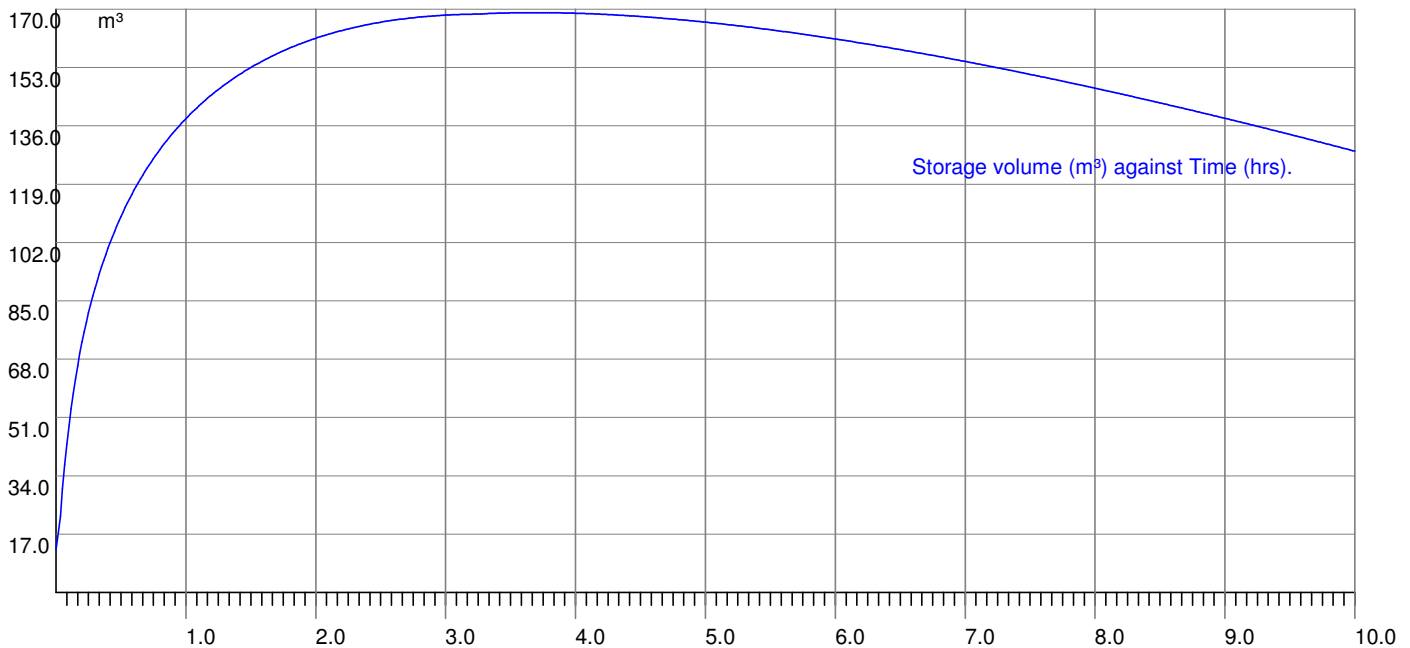
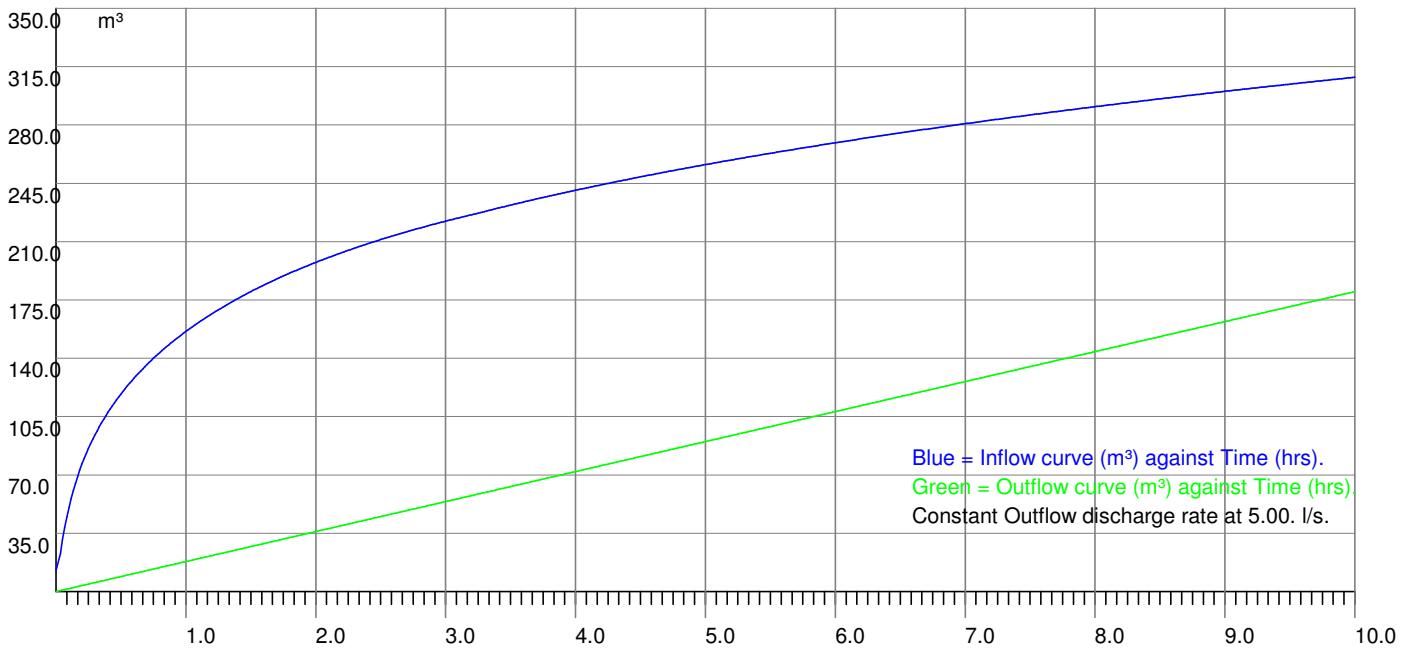
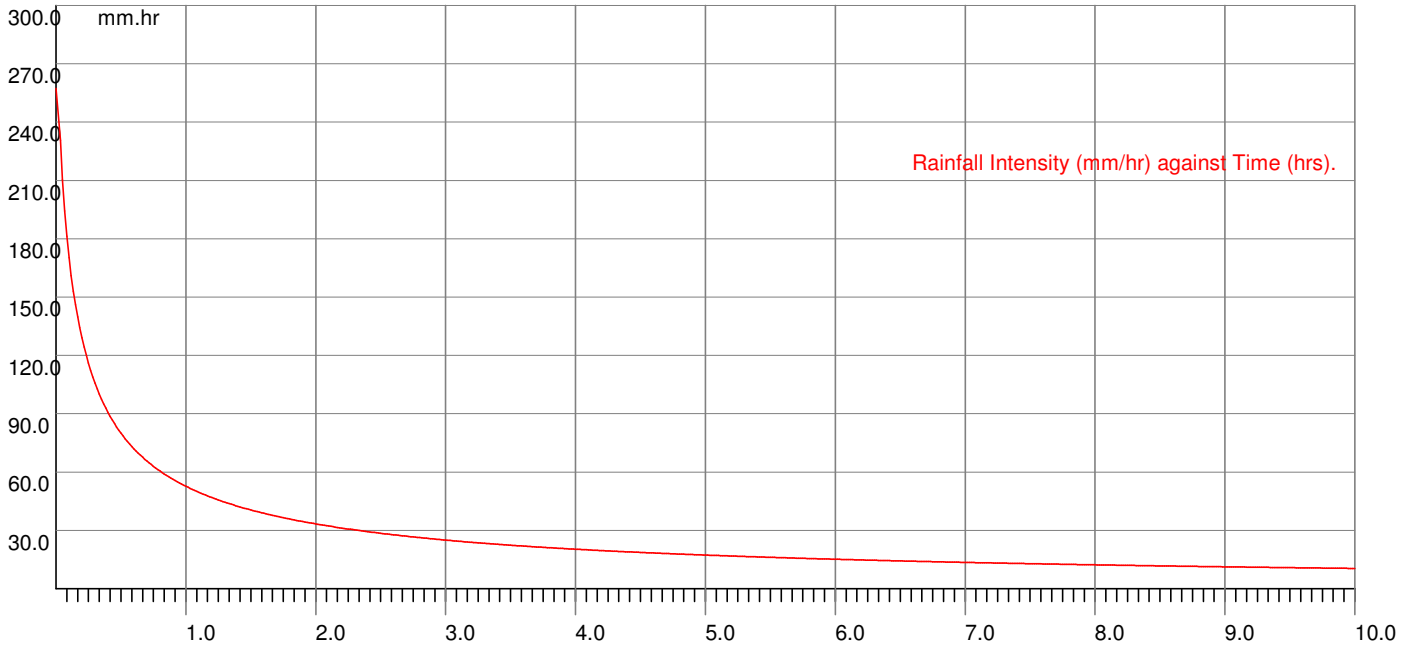
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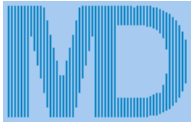
2 Bar Lane,
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YO1 6JU
Tel: (01904) 780955
email: admin@aaahplanning.com

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Project **Thurgoland**

Title **Peak flow storage calcs for Thurgoland**





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<http://www.aahplanning.com/>

2 Bar Lane,
York,
YO1 6JU
Tel: (01904) 780955
email: admin@aaahplanning.com

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Explanatory notes for Peak Flow Storage

- 1) This system uses the rainfall intensity/ duration curve calculated using either the Wallingford or FEH method as selected.
- 2) The balance is calculated from the inflow minus the outflow.
- 3) The storage volume is the maximum value of the balance curve.
- 4) This method was described by Davis (1963) - see Butler & Davies, 2nd edition, p294
- 5) References to 'storm duration' relate only to the hydrograph method (qv).
- 6) There are always 600 steps in the calculation process, thus a 'run' time of 10 hours will be sampled every minute,

Explanatory notes for Hydrograph Storage

- 1) The user has the choice of Summer or Winter curves
- 2) The mean intensity varies with the duration of the storm curve
- 3) There are always 120 steps in the calculation process, irrespective of storm duration.
- 4) The balance is calculated from the inflow minus the outflow.
- 5) The storage volume is the sum of the balance values for each step.
- 6) Varying durations should be tried to find the maximum storage value - this can be narrowed down very closely.

*Modelling using the flow characteristics of the restrictor is available using Vortex Control modelling function. Please be aware that this function needs the full design data file to function.

Why do the two methods give different results?

The rainfall characteristics for each method are very different.

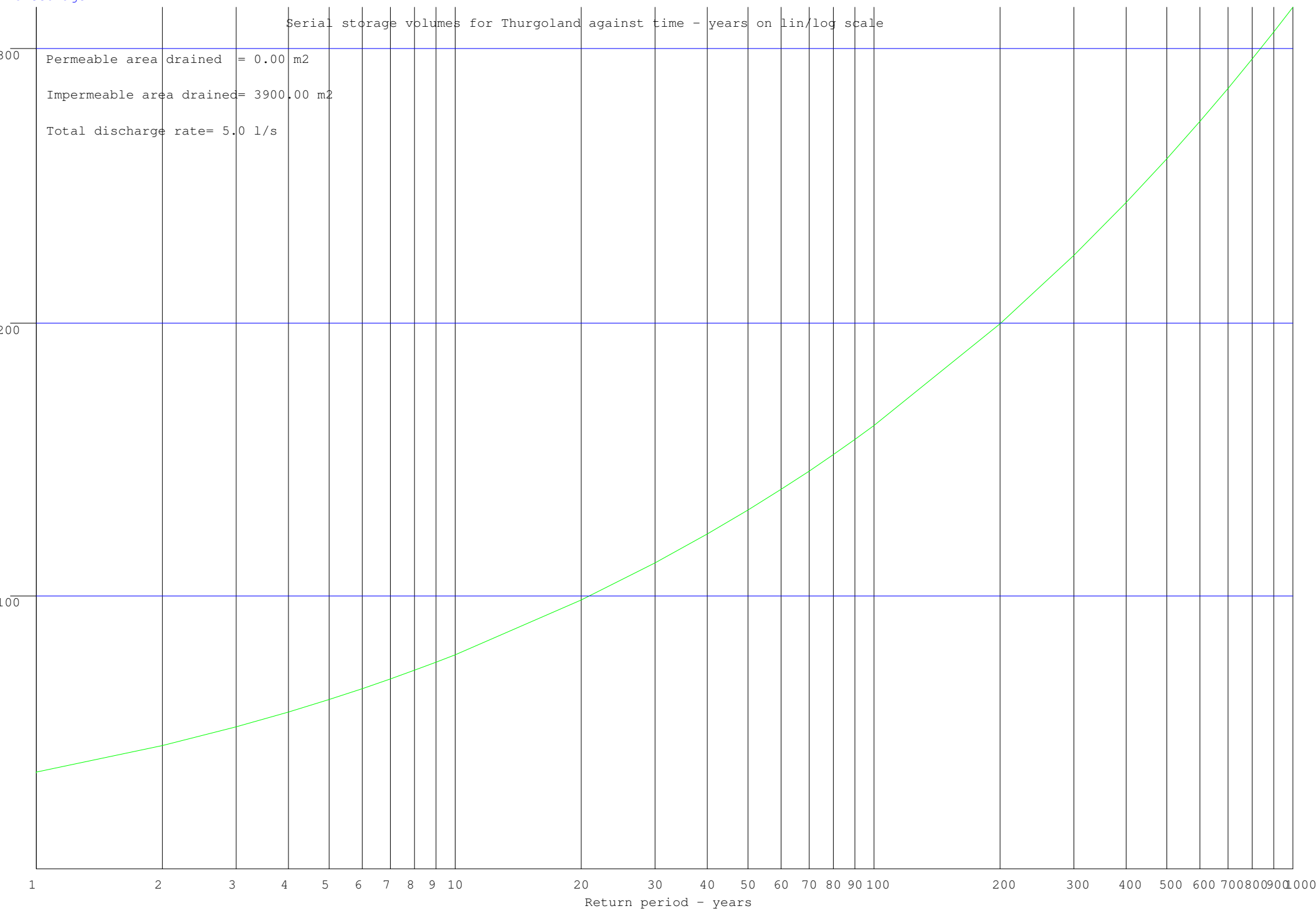
The Peak flow (using the Intensity/Duration/Frequency curve) does not model the actual rainfall. This curve is joined points which represent the mean intensity of a storm at a given duration i.e. a value of 19.5 mm/hr for a 60 minute storm indicates that over the sixty minute period, the mean intensity was 19.5 mm/hr. The calculation method samples the IDF curve for a given location and frequency (Return Period) and calculates the storage for that rate and duration less the outflow volume. The maximum value is displayed as the 'worst case' storage.

The hydrograph method uses a standard curve for either Winter or Summer storms. Traditionally these are symmetrical about the central peak. UK rainfall does not fit into this convenient curve, so the calculations are dealing with a stylised set of data. The mean intensity for the storm is calculated from the IDF curve and applied to the curve data, calculating the storage for that step less the outflow volume. The final storage volume is the sum of the storage for all the steps.

It can be seen that these two methods are very different, and the user may have the choice of which result to use. This is not an exact science, though is often treated as such by those that do not understand the principles of the calculations.

Serial storage volumes for Thurgoland against time - years on lin/log scale

Permeable area drained = 0.00 m2
Impermeable area drained= 3900.00 m2
Total discharge rate= 5.0 l/s

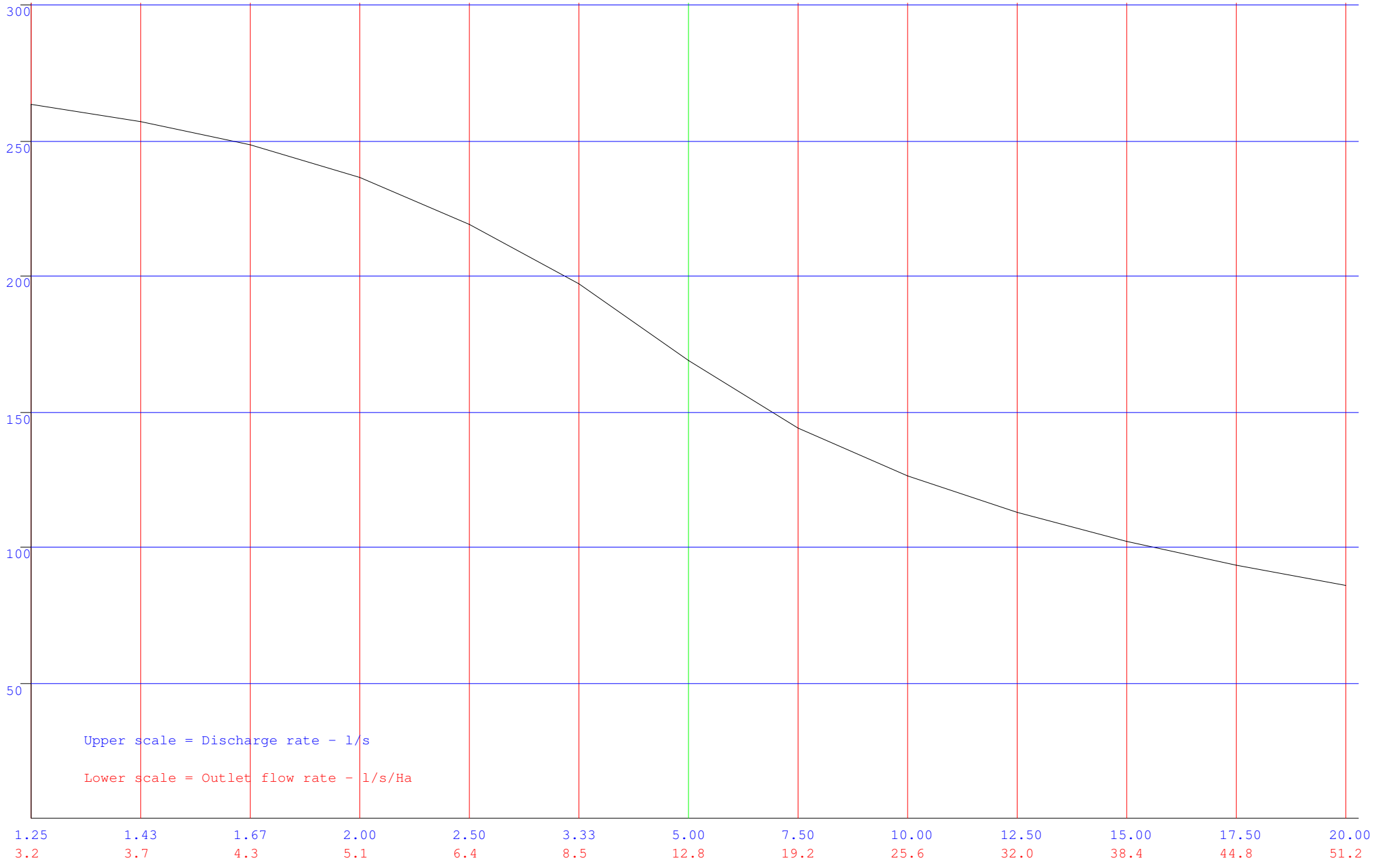


Return period - years

Storage volumes for Thurgoland against varying discharge rates

Design discharge rate= 5.0

m3 storage



APPENDIX D













YORKSHIRE WATER NETWORK ENQUIRY

YORKSHIRE WATER PROTECTION OF MAINS AND SERVICES







1. The position of Yorkshire Water Services Ltd (YWS) apparatus shown on the existing mains record drawing(s) indicates the **general** position and nature of our apparatus and the accuracy of this information cannot be guaranteed. Any damage to YWS apparatus as a result of your works may have serious consequences and you will be held responsible for all costs incurred. Prior to commencing major works, the exact location of apparatus must be determined on site, if necessary by excavating trial holes. The actual position of such apparatus and that of service pipes which have not been indicated must be established on site by contacting the Customer Helpline on 0845 124 24 24 for both water and sewerage.
2. The public sewer and water network is lawfully retained in its existing position and the sewerage and water undertaker is entitled to have it remain so without any disturbance. The provisions of section 159 of the Water Industry Act 1991 provides that the undertaker may "inspect, maintain, adjust, repair or alter" the network. Those rights are given to enable the undertaker to perform its statutory duties. Any development of the land or any other action that unacceptably hindered the exercise of those rights would be unlawful. The provisions contained in Section 185 of the Water Industry Act 1991 state that where it is reasonable to do so, a person may require the water supply undertaker to alter or remove a pipe where it is necessary to enable that person to carry out a proposed change of use of the land. The provisions contained in Section 185 also require the person making the request to pay the full cost of carrying out the necessary works.
3. Ground levels over existing YWS apparatus are to be maintained. Sewers in highways will **generally** be laid to give 1200mm of cover from finished ground level working to kerb races, other permanent identification of the limits of the road or to an agreed line and level. Substantial increases or decreases to this 1200mm depth of cover will result in the sewer being re-laid at your expense. Water mains and services will **generally** be laid with a minimum of 750mm depth of cover however some mains and services usually those installed over 50 years ago may have less ground cover.
4. If surface levels are to be decreased / increased significantly the effects on existing water supply apparatus will be carefully considered and if any alterations are necessary, the costs of the alterations will be recharged to you in full. Outlets on fire hydrants must be no more than 300mm below the new levels and all surface boxes must be adjusted as part of the scheme.
5. To enable future repair works to be carried out without hindrance; any pipe, cable, duct, etc. installed parallel to a water main or service pipe should not be installed directly over or within 300mm of a water main or service pipe or 1000mm of a waste water asset. Where a pipe, cable, duct, etc. crosses a main or service it should preferably cross perpendicular or at an angle of no less than 45° and with a minimum clearance of 150mm. These requirements apply to activities within an existing highway and are relevant to the installation of pipes, cables, ducts, etc. up to and including 250mm in diameter (*see illustration below*). Necessary protection measures for installations greater than 250mm in diameter and/or in private land will need to be agreed on an individual basis. Installations within a new development site must comply with the National Joint Utilities Group publication Volume 2: NJUG Guidelines On The Positioning Of Underground Utilities Apparatus For New Development Sites.
6. All excavation works near to YW apparatus should be by hand digging only.
7. Backfilling with a suitable material to a minimum 300mm above YW apparatus is required.
8. Adequate support must be provided where any works pass under YW apparatus.
9. Jointing chambers, lighting columns and other structures must be installed in such a way that future repair or maintenance works to YW apparatus will not be hindered.
10. Apparatus such as; railings, sign posts, etc. must not be placed in such a way that they prevent access to or full operation of controlling valves, hydrants or similar apparatus. YWS surface boxes must not be covered or buried. Any adjustment, alteration or replacement of manhole covers must be agreed on site prior to the commencement of the works with a YWS Inspector who may be contacted via our Call Centre on 0845 124 24 24.
11. Explosives shall not be used within 100 metres of any Yorkshire Water Services apparatus or installations.
12. Vibrating plant should not be used directly over any apparatus. Movement or operation by vehicles or heavy plant is not to be permitted in the immediate vicinity of YWS plant or apparatus unless there has been prior consultation and, if necessary, adequate protection provided without cost to YWS.
13. **Under no circumstances** should thrust boring or similar trenchless techniques commence until the actual position of the Company's mains/services along the proposed route have been confirmed by trial holes.
14. Any alterations to the highway should be notified following the procedures outlined in the New Road and Street Works Act 1991 Code of Practice; Measures Necessary Where Apparatus Is Affected By Major Works (Diversions Works).

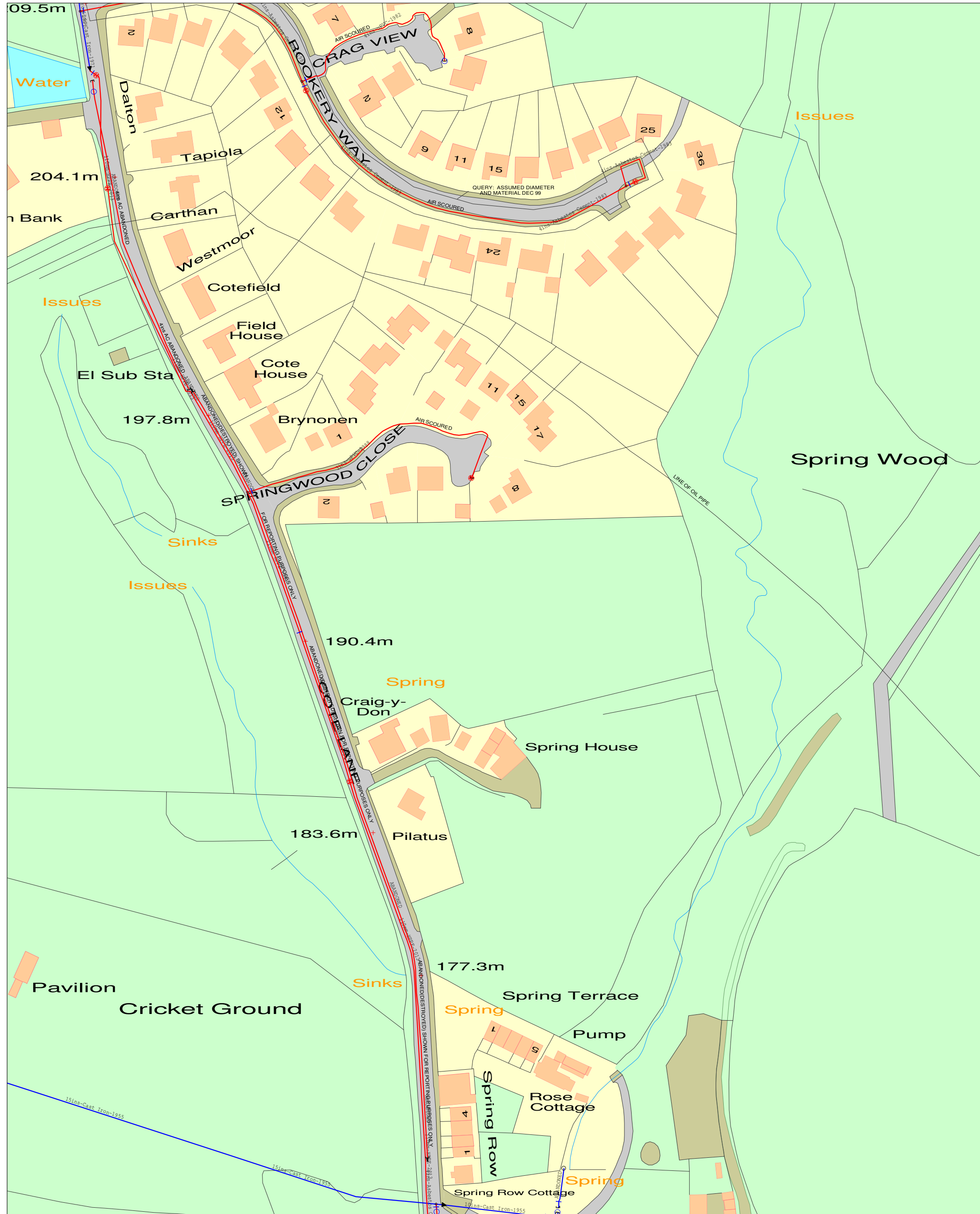
15. You will be held responsible for any damage or loss to YWS apparatus during and after completion of work, caused by yourselves, your servant or agent. Any damage caused or observed to YWS plant or apparatus should be immediately reported to YWS. Should YW incur any costs as a result of non-compliance with the above, all costs will be rechargeable in full.
16. You should ensure that nothing is done on the site to prejudice the safety or operation of YWS employees, plant or apparatus.
17. In accordance with the New Roads and Street Works Act 1991, Chapter 22, Part 3, Section 80. The location of any identified YW asset "*which is not marked, or is wrongly marked, on the records made available*" should be communicated back to Yorkshire Water. The location of the apparatus should be identified on copies of the supplied plans which should be returned to Yorkshire Water (Asset Records Team) with photographic supporting evidence where possible.
18. The Government has decided that responsibility for private sewers serving two or more properties and lateral drains (the section of pipe beyond the boundary of a single property, connecting it to the public sewer) will be transferred to the water companies on Oct 1 2011. Private pumping stations will also transfer during the period 1 October 2011 – 1 Oct 2016. Records of these assets may not yet be shown on the existing mains record drawing(s). If you encounter any of these assets you must inform Yorkshire Water Services Ltd (YWS).
19. Please note that the information supplied on the enclosed plans is reproduced from Ordnance Survey material with the permission of the Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office, © Crown Copyright. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Licence Number 1000019559.
20. This information is for guidance only and the position and depth of any YW apparatus is approximate only. Likewise, the nature and condition of any YW apparatus cannot be guaranteed. YW has no responsibility for recording the locations of privately owned apparatus. As of 1 October 2011, there may be some lateral drains and/or public sewers which are not documented on YW records but may still be present. For the avoidance of doubt, this information is not a substitute for appropriate professional and/or legal advice. YW accepts no responsibility for any inaccuracy or omissions in this information. The actual position of YW apparatus must be determined on site by excavating trial holes by hand. YW requires a minimum of two working days' written notice of the intention to excavate any trial holes before any excavation can be undertaken. If there are any queries in this respect please contact Yorkshire Water on 0845 124 24 24.

Sewer Legend

	Combined Sewer		S24 Combined Sewer
	Surface Water Sewer		S24 Surface Water Sewer
	Foul Sewer		S24 Foul Sewer
	Section 104 Sewer		Public Rising Main
	Pumping Station		Abandoned Sewer
	Public Sewage Treatment Works		Syphon Sewer & Vacuum Sewer
+			Property Identifier

Water Legend

	Water Main 4" and below
	Water Main 4" and above
	Raw Water Main
	Private Water Main
	Fire Hydrant
	Pumping Station



429047 : 400433

Map Name : SE2900SW

Title



Yorkshire Water,
PO Box 500,
Halifax Road,
Bradford BD6 2LZ
Contact Name :
Ms H Webster
Contact Tel :

Notes

Partial Key

- Water mains up to 4" in diameter
- Water mains over 4" in diameter
- Raw water mains
- Private water mains

The position and depths of apparatus shown on this plan are approximate only. The exact positions and depths should be obtained by excavation trial holes.

Scale : 1:1250

Drg No :

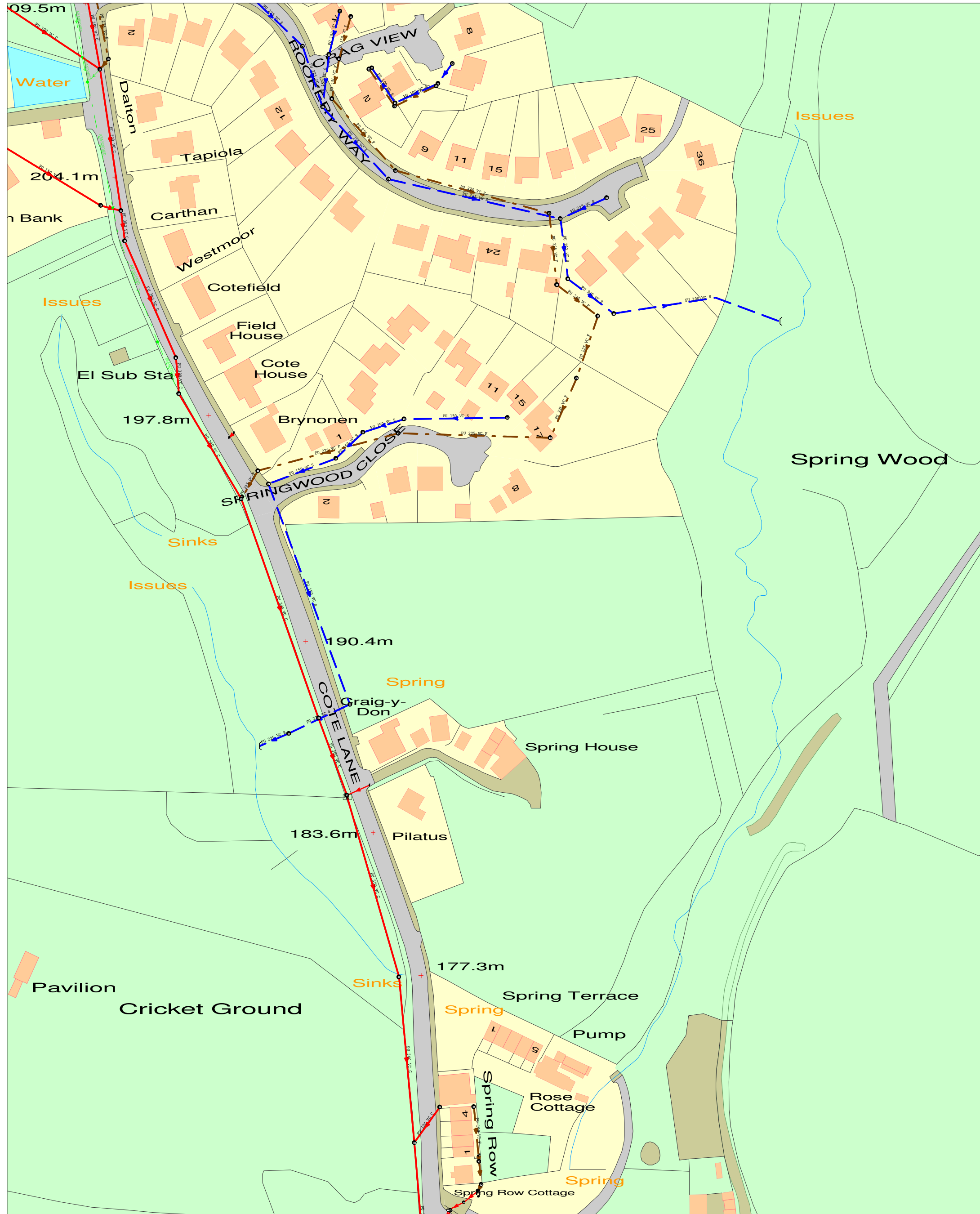
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Date Req : 29/01/2016, 09:33:14

Date Gen : 29/01/2016, 09:33:15

Source : Water Network Enquiry





429047 : 400433

Map Name : SE2900SW

Title



Yorkshire Water,
PO Box 500,
Halifax Road,
Bradford BD6 2LZ
Contact Name :
Ms H Webster
Contact Tel :

Notes

Partial Key
Foul Sewer = F
Combined Sewer = C
Surface Water Sewer = SW
Trade Sewer = TD
Partially Separate = PS

This plan is furnished as a general guide only and no warranty as to its correctness is given or implied. This plan must not be relied upon in the event of excavations or other works made in the vicinity of public sewers. No house or property connections are shown.

Date Req : 29/01/2016, 09:33:31

Date Gen : 29/01/2016, 09:33:32

