

A01. These notes are intended to augment drawings and specifications. Where conflict of requirements exists the order of precedence shall be as shown in the specification. Otherwise the strictest provision shall govern.

A02. This drawing to be read in conjunction with all other relevant drawings and specifications.

A03. Drawings not to be scaled. All dimensions to be checked on site by the contractor. Any discrepancies to be notified to the Engineer and further instructions obtained before work is commenced.

No part of this drawing may be reproduced, stored in a retrieval system or transmitted in any form or by any means without prior permission in writing from RAB Engineering LTD

Manhole construction - refer to CPA technical bulletin Sept 2001 outlining changes to relevant British Product Standards BS5911-2001/1994. All precast concrete products are to be kitemarked or they will be rejected as part of an adoptable system. Manhole cover slabs to BS5911.

Manhole covers to have a clear opening of 600 x 600mm and shall be class D400 to BS EN 124 with 150mm deep frames.

Filled ground must be filled and consolidated under the supervision of ST before any sewer works are carried out. All adoptable sewers to be BSI kitemarked, (certified to WIS-4-35-01)

Plastic channels are not acceptable

All custom built trunkwork to be hot dipped galvanised prior to final fitting.

Adoptable sewer pipes to be laid in max 3m lengths unless there is a specific operational need to lay longer lengths.

United Utilities are not obliged to accept filter drain / land drainage runoff into the public sewer network or adoptable drainage network (directly or indirectly). An alternative method of disposal of land drainage runoff will therefore be required and you will have to liaise with the Local Authority, Land Drainage Section with regard to the disposal of the filter drain/land drainage runoff.

**MANHOLE CONSTRUCTION.**  
 IN LIEU OF THE STANDARD DETAILS UNITED UTILITIES WILL ACCEPT FP MACCANN EASI-BASE PRECAST MANHOLE BASES AND FP MACCANN WIDE WALLED MANHOLE RINGS.  
 DEVIATION FROM THESE DRAWING BY UTILIZING THE ABOVE PRODUCTS MUST BE APPROVED FOR INDIVIDUAL MANHOLES BY UNITED UTILITIES PRIOR TO CONSTRUCTION

**ALL MANHOLES AND DRAINAGE COMPONENTS TO COMPLY WITH CODE FOR ADOPTABLE STANDARD DETAILS. ANY DEVIATION BETWEEN THESE AND THE CURRENT DESIGN TO BE CLARIFIED PRIOR TO CONSTRUCTION.**

**STREET LIGHTING**  
 Column: 6m Valmont or ALC aluminium with planted root  
 Lantern: Post top mounted Urbis Ampere Mini LED lantern with 8 LED AMPERA MINI - 5118 - 8 LED - NW 4000K - 500mA - 14.2W  
 Tilt: 0 degrees (no tilt)  
 Other: Integral driver, NEMA socket

**FLOOD ROUTING**  
 We have simulated the 400year/15min storm which shows flooding only occurs at S1, S2 & S34. The carriageway is in this area will accommodate approx 80cum before overflowing between 4/35 & 4/39 and flowing north to adjacent fields. Due to the layout design a low point has resulted at the end of road 24, flooding from here will pass through back gardens to 20 where it will re-enter the system.

Surface water discharge to watercourse  
 Approved discharge from S5 49.3 l/s  
 Qbar from new development 44.7 l/s  
 Total 100year discharge 94.0 l/s

Existing manhole S25 cover level adjusted to road level

Existing manhole S24 cover level adjusted to road level

S30-S45  
 Dian 300 G120  
 Upvc 8m

S16-S30  
 Dian 600 G134  
 CNC 8m

S45 to be constructed on existing sec 104 sewer invert to be confirmed

Highway Drain  
 S15-S6  
 Dian 225 G150  
 Upvc 13m

S63-S62  
 Dian 225 G151  
 Upvc

Existing manhole S23 cover level adjusted to road level

Maximum discharge to watercourse 48.1 l/s/sec for the 100year event inc 30% climate change.

Cover slabs must carry the BSI Kitemark or will be rejected by United Utilities Inspector. Where the clear opening of the Kitemarked product is different to that of the cover and frame, a loading bearing slab should be fitted above the cover slab to bring the size down to 600mm x 600mm for the United Utilities specified cover size. Please refer to Concrete Pipes Systems Association (CPSA), 'Technical Bulletin' issued Autumn 2004 for Kitemarked cover slab opening sizes.

Sulphate resistant cement (C20-DC2) and precast concrete products must be used or a laboratory report provided proving that such precautions are not necessary.

Sewers to be laid in class S bedding (150mm granular bed and surround). Where depth of cover is less than 1.2m in highways and verges (or less than 900mm in non vehicle access areas) then a concrete slab should be provided above the granular bed and surround.

The chamber size of manholes with more than one connection in them may need to be increased one increment to accommodate the connection and bends. See individual manhole detail

Contractors should be aware of significantly large diameter pipes and manhole chamber rings proposed in this design and precautions should be taken in movement and placing of such items. Also to be considered is the depth of excavation of the drainage works especially the large diameter components up to 8m deep excavations.

All adoptable sewer works and materials to be in accordance with current Code for Adoption. The relevant British / European and United Utilities standards / requirements / addendum & Kitemarked.

The adoptable sewers shall be a min 1.0m and manholes 0.5m from the curb and service margins.

Sewers must have 5m clearance from trees and hedges see Code for Adoption restrictions on tree planting / types.

Bedding and backfill material to conform with the Water Industry specification 4-08-02 (table A2)

**Manhole S5**  
 SH172  
 Head 2.20m Flow 25.0l/s

**Manhole S63**  
 MD-SHE-0182-1700-1200-1700  
 Head 1.20m Flow 17.5l/s

**Manhole S30**  
 MD-SHE-0230-2900-1295-2900  
 Head 1.295m Flow 29.0l/s

**SURFACE WATER 100YEAR RESUME OF MICRODRAINAGE RESULTS**

APPROVED MAXIMUM DISCHARGE TO RIVER 94 l/s

STORM DURATION	DISCHARGE FROM S5	S63 Discharge rate & water level	S30 Discharge rate & water level	DISCHARGE FROM S45**	TOTAL DISCHARGE TO RIVER
15Min	27.6	16.9 / 79.790	26.9 / 79.333	44.9	72.5
30Min	30.8	16.9 / 79.917	29.0 / 79.490	45.8	76.6
60Min	35.5	16.9 / 79.916	29.0 / 79.625	45.6	81.1
120Min	40.3	16.9 / 79.673	29.0 / 79.752	44.4	84.7
180Min	41.4	16.9 / 79.405	29.0 / 79.813	43.9	85.3
240Min	40.9	16.8 / 79.210	29.0 / 79.847	43.1	84.0
300Min	39.1	13.9 / 79.088	29.0 / 79.864	40.2	79.3
480Min	11.4 / 79.062	29.0 / 79.858	37.7		

Basin volume dimensions

Basin level (contour)	plan area sqm
78.80 (0.0)	275
78.90 (0.1)	945
79.00 (0.2)	1007
79.10 (0.3)	1074
79.20 (0.4)	1143
79.30 (0.5)	1214
79.40 (0.6)	1288
79.50 (0.7)	1363
79.60 (0.8)	1440
79.70 (0.9)	1519
79.80 (1.0)	1599

S5 control manhole from phase 1 (approved 30% climate change) MILL HILL 3-6-15-5m  
 Water level in S63 is the water level in the D1050 storage (plots 16-22)  
 Water level in S30 is the water level in the basin.  
 Discharge from S45 is the flow from Uhref 420029492 & 04087452  
 Uhref 420029492 40% climate change - 04087452 40% climate change and 10% urban crop

**GROUND WATER MONITORING**

Ref	Basin level	Grnd water level	17/3/22 water level	16/5/22 water level	14/7/22 water level	11/8/22 water level	19/12/22 water level	7/2/23 water level
BH1	78.80	79.50	77.70 (1.80)	77.65 (1.85)	77.60 (1.90)	77.55 (1.85)	77.80 (1.70)	77.75 (1.75)
BH2	78.80	79.88	77.43 (2.45)	77.55 (2.30)	77.48 (2.40)	77.45 (2.40)	77.78 (2.10)	77.68 (2.20)
BH3	78.80	80.57	77.07 (3.50)	77.62 (2.95)	77.57 (3.00)	77.57 (3.00)	77.67 (2.90)	77.57 (3.00)

Figure in brackets are the standing water depths recorded

- C. S85 hydrobrake revised 8-8-17
- D. Foul water pump station revised position 4-9-17
- E. Revised for section 104/38 submission 15-12-17
- F. Plots 15-64 & 80-82 revised and updated for section 104 & 38 submission 18-4-19
- G. Indicative layout added for northern part of the development. existing and proposed sewer routes added following meeting with UU 22-6-19
- H. Full redesign in line with Alpha Design layout 17-10-19
- J. Private drainage added, storage tank No1 volume and tank size revised 19-11-19
- K. Details/revisions for section 104 submission 28-11-19
- L. Revised following UU comment 29-11-19 2-12-19
- M. Phasing clarified 16-7-20
- N. UU reference number added 2-8-20
- P. Full redesign following layout changes and implementation of surface water storage basin 14-8-21
- Q. Plots 13-15 & 18 revised 26-8-21
- R. Forbay added to basin 11-10-21
- S. Street lighting added 16-12-21
- T. Sewer 36-10 increased to D525, impermeable areas to true areas 22-2-22
- U. Ground water monitoring details added 4-4-22
- V. Full redesign following layout changes and current planning approval 20-4-23
- W. Basin levels adjusted, UU comments addressed 26-6-23
- X. S5-7-8-13-14-11, S12-8 & S16-6 revised, private drainage plots 18-23 & S30 hydrobrake amended. Microdrainage schedule amended. 18-7-23
- Y. Plots 27-32, 4/29-4/40, 4/49 & 4/50 FFL revised SW drainage redesigned, adjustment to cover levels. Basin amended to UU requirements 12-8-23

**R.A.B. ENGINEERING DESIGN LTD**

12 BERRY HOLME CLOSE  
 SHEFFIELD S35 1AB  
 TEL.(0114)2464871

High Grange Developments Ltd

Mill Hill, Cleator Moor  
 Engineering Layout 27-32 & 4/01-4/55  
**Flood routing**

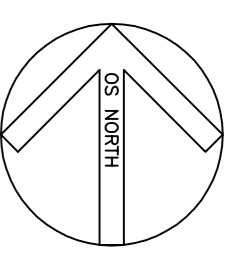
DRAWN BY rab  
 SCALE 1:500 DATE April 17  
 DRAWING No 1083-1-2-FLOOD REV Y

- A. Storage revised to D1800mm, highway vertical alignment revised. 22-5-17
- B. Main sewer network revised, Tubisider storage added, FW pump station relocated, FW sewers revised, Floor levels amended, Skeletal private drainage added, rising main route and outfall location revised 7-8-17



PRELIMINARY ONLY

100year/15minute localized flooding, 11.5cum available within the road area



LEVEL- Related to Ordnance Survey by connection to the OS Active Network by G.P.S

GRID- Related to Ordnance Survey using One Point Localisation on Station S1. Orientation at OS Grid North.

FLOOR LEVELS ARE PRELIMINARY