

Our ref: 7503FRA\_Add

Flood Risk Assessment  
Addendum Report for  
Edgehill Phase 3  
at  
High Road, Whitehaven

For : Story Homes  
Story House  
Lords Way  
Kingmoor Business Park  
Carlisle  
Cumbria  
CA6 4SL

15 March 2021

Flood Risk Assessment Addendum Report for Edgehill Phase 3  
High Road, Whitehaven, Cumbria

**Document Verification**

|                                                                                                                                                                           |                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| <b>Project Title</b>                                                                                                                                                      | Edgehill Phase 3, High Road, Whitehaven |
| <b>Project Number</b>                                                                                                                                                     | 7503                                    |
| <b>Document Title</b>                                                                                                                                                     | Flood Risk Assessment Addendum          |
| <b>Document Number</b>                                                                                                                                                    | 7503FRA_Add                             |
| This document is not to be used for contractual or engineering purposes unless the document verification sheet is signed where indicated by the approver of the document. |                                         |

Prepared by

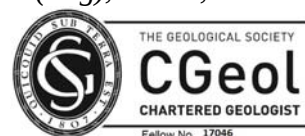
Checked and Approved




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*BSc (Hons), MSc (Eng), CGeol, FGS*



**Document Revision**

| Report Reference | Date     | Description           | Prepared | Checked and Approved |
|------------------|----------|-----------------------|----------|----------------------|
| 7503RFAAdd       | 15/03/21 | Flood Risk Assessment | A Jones  | P R Sykes            |

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## Flood Risk Assessment Addendum Report for Edgehill Phase 3 High Road, Whitehaven, Cumbria

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### 1.0 Introduction

Coopers Consulting Engineers (Coopers) have been appointed by Story Homes to provide a Flood Risk Assessment Addendum for a site off High Road in Whitehaven, Cumbria. Story Homes are proposing a new housing development, comprising of approximately 335 plots.

Story Homes are planning the construction of a mixture of semi-detached, detached, residential properties with associated access road, parking, vehicular access and landscaping subject to conditions.

Edgehill Park is a phased development, Phase 1 is complete, Phase 2 is currently under construction and this FRA Addendum is to support the 335-plot Phase 3 planning submission.

This FRA Addendum should be read in conjunction with FRA report ref RH/2546 produced by Integra Consulting Engineers Limited dated May 2013 and has been produced to address any amendments required as a result of revisiting the masterplan and updated legislation.

### 2.0 Proposed Development

Story Homes are proposing to develop land off High Road, Whitehaven, Cumbria. The latest development (phase 3) proposals consist of 335 dwellings with associated drives, shared drives, highways and POS. The original FRA undertaken by Integra considered the entire development masterplan consisting of all phases of the wider area masterplan.

The FRA for the wider area identified the entire site as being low risk of flooding but confirmed that downstream of the site there are capacity issues with Pow Beck during periods of significant rainfall. It was agreed that proposals for post development discharge of surface water is to provide betterment to the existing drainage situation in order to reduce downstream flood risk.

The drainage proposals follow the same principle with all surface water flows discharging into a dry basin constructed as part of Phase 2. The Phase 2 sewers have been designed to accommodate flows from Phase 3. Flows are then passed forward to the watercourse at a controlled flow rate of 6.6 litres per second per hectare (6.6 l/s/ha) which will provide a 20% reduction on the greenfield QBAR run-off rate.

The SUDS basin providing storage for Phase 2 & 3 is referred to as the Eco Value SUDS Area Three on the original FRA Masterplan drawing.

Coopers have undertaken a detailed surface water design based on measured impermeable areas. Refer to Appendix 2 for the proposed drainage layout and Appendix 3 for MicroDrainage calculations.

Flood Risk Assessment Addendum Report for Edgehill Phase 3  
High Road, Whitehaven, Cumbria

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### 3.0 Updates to Integra FRA

The following sections of the report are to be updated as follows:

- 3.3 Integra FRA previously stated the design should have an allowance of 20% to allow for climate change. In line with current advice we have now increased this to 40%.

*Please note: the storage volumes noted in the Integra FRA volumes are estimates only based on an assumed 50% impermeable area*

### 4.0 Design Criteria

The total site flow restriction is 163 l/s

|                              |                   |                         |
|------------------------------|-------------------|-------------------------|
| Eco value SUDS Area 1        | = 19.0 l/s        | Phase 1                 |
| Eco value SUDS Area 2        | = 30.5 l/s        | Phase 1                 |
| <b>Eco value SUDS Area 3</b> | <b>= 113.5l/s</b> | <b>Phases 2 &amp; 3</b> |

The SUDS pond serving Phases 2 and 3 is currently restricted to 25 l/s. This will be retrofitted with a new vortex flow control to provide a higher allowable flow rate of 113.5l/s.

Surface water has been designed for a 100-year return period plus a 40% allowance for climate change.

The SUDS pond constructed as part of Phase 2 is designed with a 600mm permanent pool of water with attenuation above. The total attenuation storage volume required in the pond is 6,600cu.m. with increased water depths of 574mm for the 30-year storm event and 1024mm for the 100-year storm event including a 40% climate change allowance.

Flood Risk Assessment Addendum Report for Edgehill Phase 3  
High Road, Whitehaven, Cumbria

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## **5.0 Conclusions and Recommendations**

The site is located in Flood Zone 1 and has been shown to be at low risk of flooding. Therefore, mitigation measures are not considered necessary for any future development at the site.

This addendum has shown the phase 3 drainage scheme is still in accordance with the original Integra FRA and now comprises a detailed design using measured impermeable areas.

The water depths within the basin are considered acceptable for the 100-year storm event.

Flood Risk Assessment Addendum Report for Edgehill Phase 3,  
High Road, Whitehaven, Cumbria

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**Appendix 1**

**Original Flood Risk Assessment**

RH/2546

Integra Consulting Engineers Ltd

# **FLOOD RISK ASSESSMENT**

**SITE AT RHODIA**

**HIGH ROAD**

**WHITEHAVEN**

**ON BEHALF OF**

**STORY HOMES**

Integra Consulting Engineers Limited  
2<sup>nd</sup> Floor  
Fountain House  
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M2 2EE

RH / 2546

May 2013

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## 5.0 CONCLUSIONS

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## **1. INTRODUCTION**

Integra Consulting has been commissioned by Story Homes to undertake a Flood Risk and Surface Water Drainage Assessment (FRA) for the site at Rhodia, Whitehaven. This document has been prepared to accompany the outline planning application for the proposed residential use development of the application site.

The objective of the FRA was to identify potential flooding issues and any consequent implications on the proposed site development. Both existing and proposed surface water drainage for the development site are also considered in detail. The assessment has been undertaken in accordance with the pro-forma guidance contained in Department for Communities and Local Government document 'Technical Guidance to the National Planning Policy Framework' dated March 2012, the Copeland Strategic Flood Risk Assessment produced by Jacobs dated August 2007 and DEFRA / Environment Agency publication SR744 Preliminary Rainfall Runoff Management for Developments revision E dated January 2012.

Consultations have been undertaken with the Environment Agency (EA), United Utilities and Copeland Borough Council.

## **2.0 STANDARDS AND LIMITATIONS**

This report has been prepared solely for use by Story Homes. It shall not be relied upon, or transferred to, any other party without prior written authorisation of Integra Consulting.

The findings and opinions in the report are based on information derived from a variety of different sources. Integra Consulting do not accept any liability for the accuracy or otherwise of any information provided by third parties.

It should be noted that some of the aspects considered in this study may be subject to change with time. Therefore, if the development is delayed or postponed, consideration may need to be given to reviewing such issues to confirm that no changes have taken place, either at the site or within relevant legislation.

To date we have consulted with the Environment Agency (EA), Copeland Borough Council and United Utilities (UU). Further consultations are likely as the scheme progresses. It should be noted that even where responses have been received from Regulators these could be subject to change at a later date.

### **3.0 CURRENT SITUATION**

#### **3.1 Site Location and Description**

The site is located adjacent to the former Rhodia chemical works off High Road, Whitehaven, Cumbria at National Grid reference E297200, N515600.

A site location plan is shown in Appendix 1.

The approx. 27.7 hectare site is situated in an industrial setting adjacent to a residential area and is approximately rectangular in shape. The majority of the site area is greenfield consisting of existing farm land with the exception of a 1.7 hectare area of hardstanding (former industrial service depot) located adjacent to the western site boundary along High Road.

There is a single on site watercourse, which lies directly along the eastern boundary to the site. In addition to this what is believed to be a manmade ravine cuts across the southern section of the site effectively dividing the site into two. This steep sided ravine extends to a maximum depth of 10m below adjacent existing site levels.

The existing greenfield section of the site is undrained, although the natural lie of the land slopes directly towards the watercourses to the east and the south.

The site generally slopes gently from north to south with a few steeper gradients in isolated areas, particularly adjacent to the watercourse / ravine. The north end of the site lies at circa 95m above Ordnance Datum whereas, at its southern tip, lowest site levels are circa 54m above Ordnance Datum creating an average 1 in 25 cross fall over the site extent.

It is noted that a sub-surface high pressure gas main and a water main cross the site adjacent to the western boundary (refer to topographical survey in Appendix 5).

### **3.2 Hydrology and Flooding**

The EA have confirmed that the site lies within Flood Zone 1 as defined in Table 1 of the Department for Communities and Local Government document 'Technical Guidance to the National Planning Policy Framework' dated March 2012. Accordingly, it is not appropriate to undertake numerical flood analyses for the site.

The EA have confirmed that, downstream of the site, there are capacity issues with Pow Beck during periods of significant rainfall. Accordingly, it has been agreed that proposals for post development discharge of surface water is to provide betterment to the existing drainage situation in order to reduce downstream flood risk.

### **3.3 Climate Change**

The detailed design of the on site surface water drainage system will be in accordance with United Utilities requirements for no surface flooding to occur during a site critical 1 in 30 year storm event.

Any necessary on site attenuation to limit the rate of surface water discharge to watercourse will be designed using 1 in 100 year rainfall intensities that have been increased by 20% to allow for the effects of climate change.

The estimated maximum volume of attenuation storage required to control post development surface water discharge to green field run off parameters is 7000m<sup>3</sup> based on an enhanced 1 in 100 year event (i.e. with 20% climate

change). All on site attenuation will be provided within storage ponds (with a suitable level of freeboard) at the post development site.

### **3.4 Existing Site Drainage**

#### **3.4.1 Surface Water**

The existing greenfield site does not contain any known on site sewers, although the slope of the site naturally directs rainwater runoff towards the on-site watercourse & ravine. Along steeper sections of the site (1:10 gradient and steeper), evidence of scouring of the vegetation was noted during our site visits, highlighting surface drainage routes during rainfall periods. In addition to this, various small pipe inlets were noted within the sides of the ravine suggesting land drains discharging into the ravine.

The existing hardstanding area noted in section 3.1 is drained through a series of gullies connected into below ground drainage runs which subsequently discharge into the existing highway drain located beneath High Road. It is understood that this highway drain subsequently discharges directly into the ravine at the western end of the site via one of three existing outfalls.

From a review of the United Utilities sewer record drawings, there are no adopted surface, foul or combined sewers located within the immediate vicinity of the site. However, a combined sewer is located in Low Road circa 300m to the east of the site, and a surface water sewer is located in Skiddaw Road circa 400m to the east of the southern boundary of the site. Both sewers are remote from the site with third party land between the site boundary and the sewers (refer to indicative drainage layout in Appendix 3).

The on site watercourse & ravine naturally drain into the Mirehouse West catchment, ultimately converging and being culverted from the site

boundary to the Mirehouse ponds located circa 300m to the south east of the site. Subsequently the Mirehouse ponds discharge into the southern arm of Pow Beck.

#### 3.4.2 Foul Water

From a review of United Utilities sewer record drawings, a combined sewer is located in Low Road circa 300m to the east of the site and a foul water sewer located in Skiddaw Road circa 400m to the east of the southern end of the site. Both sewers are remote from the site with third party land between the site boundary and the sewers (refer to indicative drainage layout in Appendix 3).

## **4.0 PROPOSED DEVELOPMENT**

### **4.1 Development Proposals**

It is proposed that the site is developed as a residential housing estate with a total of circa 510 to 550 properties (refer to the proposed site masterplan in Appendix 6).

### **4.2 Drainage Proposals**

#### **4.2.1 Surface Water**

The issue of surface water drainage to the proposed development has been considered with reference to the hierarchy of surface water disposal as noted in the Building Regulations H3:

- i) Sustainable urban drainage systems (SUDS)
- ii) Discharge of surface water off site direct to watercourse
- iii) Discharge to adopted sewer

Using the above hierarchy, the potential for using soakaways at the site was considered in relation to the nature of the existing soils. From a study of the 1:10,000 BGS geological map of the area (ref: NX 91 NE), it is evident that the entire site is underlain by drift deposits of Quaternary boulder clay of a glacial origin. Intrusive site investigations were subsequently carried out which confirmed that the underlying strata is of a predominantly cohesive nature at shallow levels. Combined with this, the presence of underlying relatively impermeable siltstones below the majority of the site precludes soakaways as a viable and effective option for surface water discharge from the development site.

SUDS are made up of one or more structures built to manage surface water runoff. They are used in conjunction with good management of the site to prevent flooding and pollution. There are four general methods of control:

- Filter strips and swales
- Filter drains and permeable surfaces
- Infiltration devices
- Basins and ponds

Landscape features such as filter strips and swales are generally suited to relatively flat sites which allow long and narrow shallow gradient buffer strips to slow the rate of surface water runoff and thus provide water quality improvement. As noted in section 3.1, the site falls significantly from north to south. In the post development situation, following cut / fill earthworks operations, it is anticipated that site levels will fall at a gradient of approximately 1:25 over the entire site and based on this significant gradient, filter strips and swales are not considered to be either practical or suitable for use at the development site.

Filter drains and permeable surfacing are more suited to use in large car parks, and would not therefore be appropriate for drainage of the proposed adopted roads to the development site. Furthermore, filter drains and permeable surfaces work most effectively with permeable subsoil. The relatively impermeable nature of the underlying ground thus reduces the effectiveness of such techniques.

Infiltration devices drain water directly into the ground and therefore require permeable subsoil in order to operate efficiently. As noted above, the presence of impermeable boulder clays / siltstones at the site render the existing ground conditions unsuitable to accommodate infiltration basins and devices.

On the basis of the above, the use of balancing ponds is deemed to be the most suitable SUDS method of surface water treatment and discharge from the post development site.

It is proposed that treatment of surface water is carried out at each balancing pond with the use of vegetated channels, open water pools and floating reed beds. These measures will allow stilling of the rain water thus permitting sedimentation, pollution attenuation and subsequently filtering of hydrocarbons within the reed beds to ensure that water quality treatment is achieved prior to discharge to watercourse / ravine. The balancing ponds will ensure an ecological betterment, creating habitats and promoting biodiversity, whilst the use of embankments and flow controls will restrict the rate of surface water discharge into the watercourse / ravine. Furthermore, this will provide downstream benefits particularly at the Mirehouse ponds where flash flooding is currently an issue. The use of attenuated flows will provide control of site generated flood water thus reducing flash flooding whilst the ecological betterment created on site will also be translated in the flows subsequently entering these ponds.

Due to the significant site area and the existing / proposed relatively steep gradients, the use of more than one pond is considered to be the most appropriate solution in order to split the site into sub catchments thus avoiding a single significant sized pond. It is therefore proposed to utilise a total of 3 No ponds across the site which is deemed to be the optimum solution in relation to existing site gradients and watercourse locations. Refer to Appendix 3 for locations of the proposed ponds.

Considering that there is an on-site watercourse and ravine, it is proposed that surface water is subsequently discharged directly to these at a reduced, controlled flow rate and improved quality.

Following advice from the Environment Agency in relation to downstream capacity issues, it is therefore proposed to restrict the surface water

discharge rate from the post development site in order to provide betterment to the existing situation.

Surface water flows from the entire post development site will be restricted to 80% of the existing 1 in 2 year greenfield runoff rate for the site. Refer to Appendix 4 for details of greenfield runoff / surface water discharge calculations for the site.

Based upon a total site area of approximately 27.7 hectares and an anticipated total public open space of circa 3 hectares, the resultant 1 in 2 year greenfield runoff rate for the site is 203.8 litres per second (8.25 litres per second per hectare). Thus the post development surface water discharge rate will be limited to 163.04 litres per second i.e.  $80\% \times 203.8$  litres per second through the use of appropriate flow controls. However, the actual figure may increase / decrease slightly depending upon the final mix of development and POS.

Flow controls will be utilised in order to ensure site generated surface water is restricted to 163.04 litres per second during all storm rainfall events. Thus during a 1 in 30 year storm, the proposed 163.04 l/s flow will be equivalent to 47% of the existing 1 in 30 year greenfield runoff rate (which is 346.54 l/s), whilst during a 1 in 100 year event the proposed 163.04 l/s flow will be equivalent to 38% of the existing 1 in 100 year greenfield runoff rate (which is 428.05 l/s). The above information highlights the significant post development surface water discharge reductions achieved during both regular and extreme rainfall events.

Attenuation storage will be provided within the embankments to the 3 No proposed SUDS ponds across the site. Assuming a post development hardstanding : landscaping ratio of 50:50, this results in a maximum total attenuation volume of 7000m<sup>3</sup>, based upon a 1 in 100 year enhanced (20% climate change) rainfall event. Final attenuation storage volumes will be

determined once the construction stage masterplan layout is developed and thus accurate areas of hardstanding and landscaping are known.

#### 4.2.2 Foul Water

Following detailed liaison, United Utilities have confirmed that they are prepared to accommodate the full foul water discharge from the proposed development site into the existing 150mm diameter foul water adopted sewer located in Skiddaw Road, circa 400m to the east of the southern tip of the site.

Local to the site, the proposed foul water drainage system requires bridging over the existing ravine which effectively divides the overall site. Thus a pipe bridge will be provided to connect the two sites allowing post development foul water drainage of the upper section of site to be connected to the lower section and subsequently to sewer. Due to the significant depth of the ravine (>8m at the proposed bridge location), the bridge will be located at an elevation far in excess of the maximum anticipated water level within the ravine and thus will not cause any adverse effects in the post development situation.

## **5.0 CONCLUSIONS**

### **5.1 Flooding**

The EA have confirmed that the site lies within Flood Zone 1 as defined in Table 1 of the Department for Communities and Local Government document 'Technical Guidance to the National Planning Policy Framework' dated March 2012. Accordingly, it is not appropriate to undertake numerical flood analyses for the site.

The EA have confirmed that, downstream of the site, there are capacity issues with Pow Beck during periods of significant rainfall. Accordingly, it has been agreed that proposals for post development discharge of surface water is to provide betterment to the existing drainage situation in order to reduce downstream flood risk.

### **5.2 Site Drainage**

#### **5.2.1 Surface Water**

The issue of surface water drainage to the proposed development has been considered with reference to the hierarchy of surface water disposal as noted in the Building Regulations H3.

The use of balancing ponds is deemed to be the most suitable and effective method of SUDS for surface water treatment and discharge at the site. Due to the significant size of the site and the existing / proposed relatively steep gradients, the use of 3No ponds across the site is deemed to be the most optimum.

Considering that there is an existing on site watercourse and manmade ravine, it is proposed that surface water is subsequently discharged directly to these at a reduced & controlled flow rate and improved quality.

The Environment Agency have confirmed downstream capacity issues within Pow Beck and it is therefore proposed to restrict the surface water discharge rate from the post development to 80% of the existing 1 in 2 year greenfield runoff rate for the site. The resultant 1 in 2 year greenfield runoff rate for the site is 203.8 litres per second (8.25 litres per second per hectare). Thus the post development surface water discharge rate will be limited to 163.04 litres per second i.e.  $80\% \times 203.8$  litres per second through the use of appropriate flow controls. Note, the final volume is subject to increase / decrease depending upon the finalised masterplan layout / proposed total development area.

Attenuation storage will be provided within the embankments to the 3 No proposed SUDS ponds across the site. Assuming a post development hardstanding : landscaping ratio of 50:50 (to be confirmed in the final masterplan layout), this results in a maximum total attenuation volume of approx. 7000m<sup>3</sup>, based upon a 1 in 100 year enhanced rainfall event. Final attenuation storage volumes will be determined once the construction stage masterplan layout is developed and thus accurate areas of hardstanding and landscaping are known.

#### 5.2.2 Foul Water

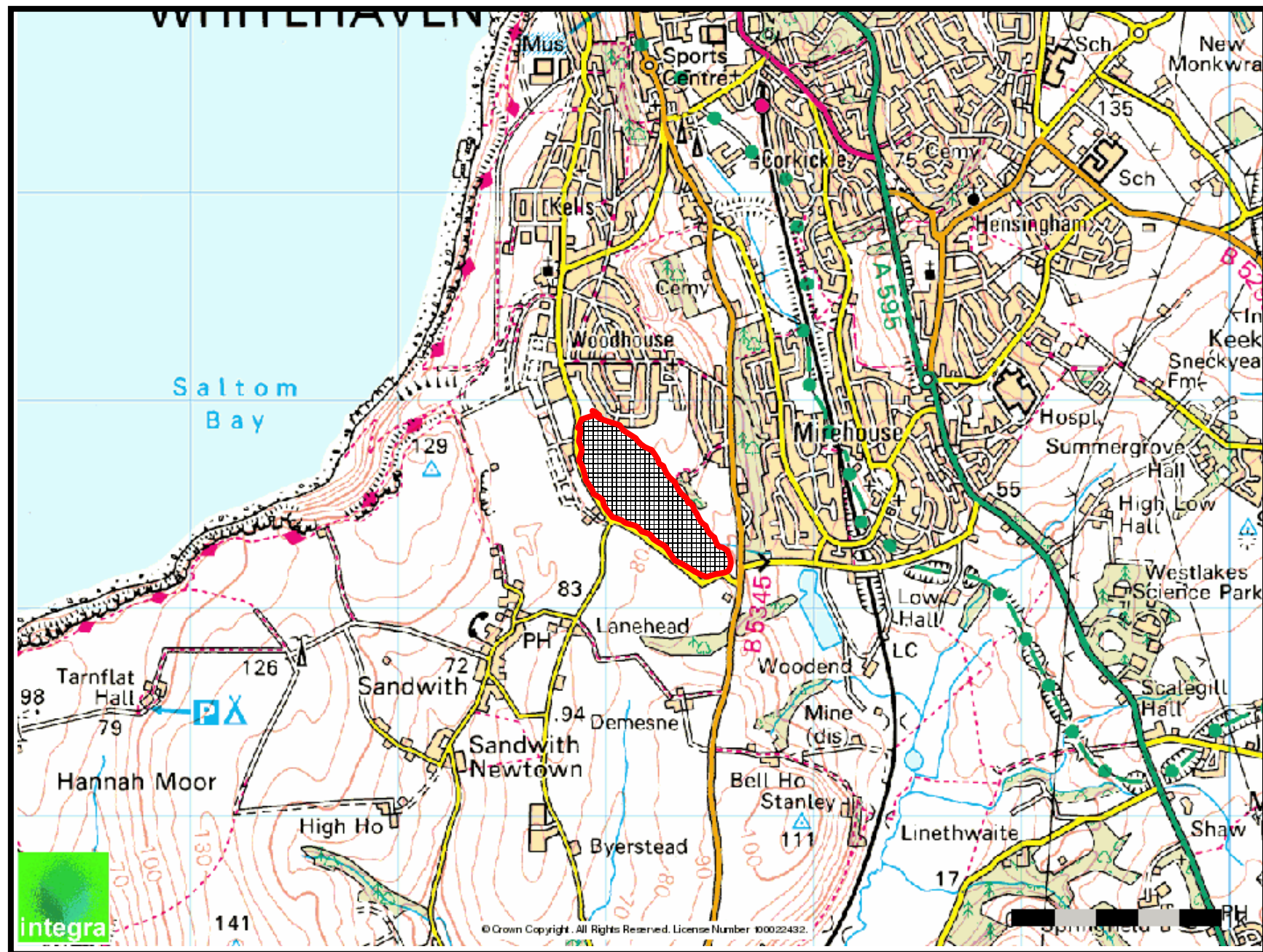
Following detailed liaison, United Utilities have confirmed that they are prepared to accommodate the full foul water discharge from the proposed development site into the existing 150mm diameter foul water adopted sewer located in Skiddaw Road, circa 400m to the east of the southern tip of the site.

Local to the site, the proposed foul water drainage system requires bridging over the existing ravine which effectively splits the site into two. Thus a pipe bridge will be provided to connect the two sites and thus allow foul water drainage of the upper section of site to be connected to the lower section and subsequently to sewer. Due to the significant depth of the ravine (>8m at the proposed bridge location), the bridge will be located at an elevation far in excess of the maximum anticipated water level within the ravine and thus will not cause any adverse effects in the post development situation.

## **APPENDIX**

## **APPENDIX 1**

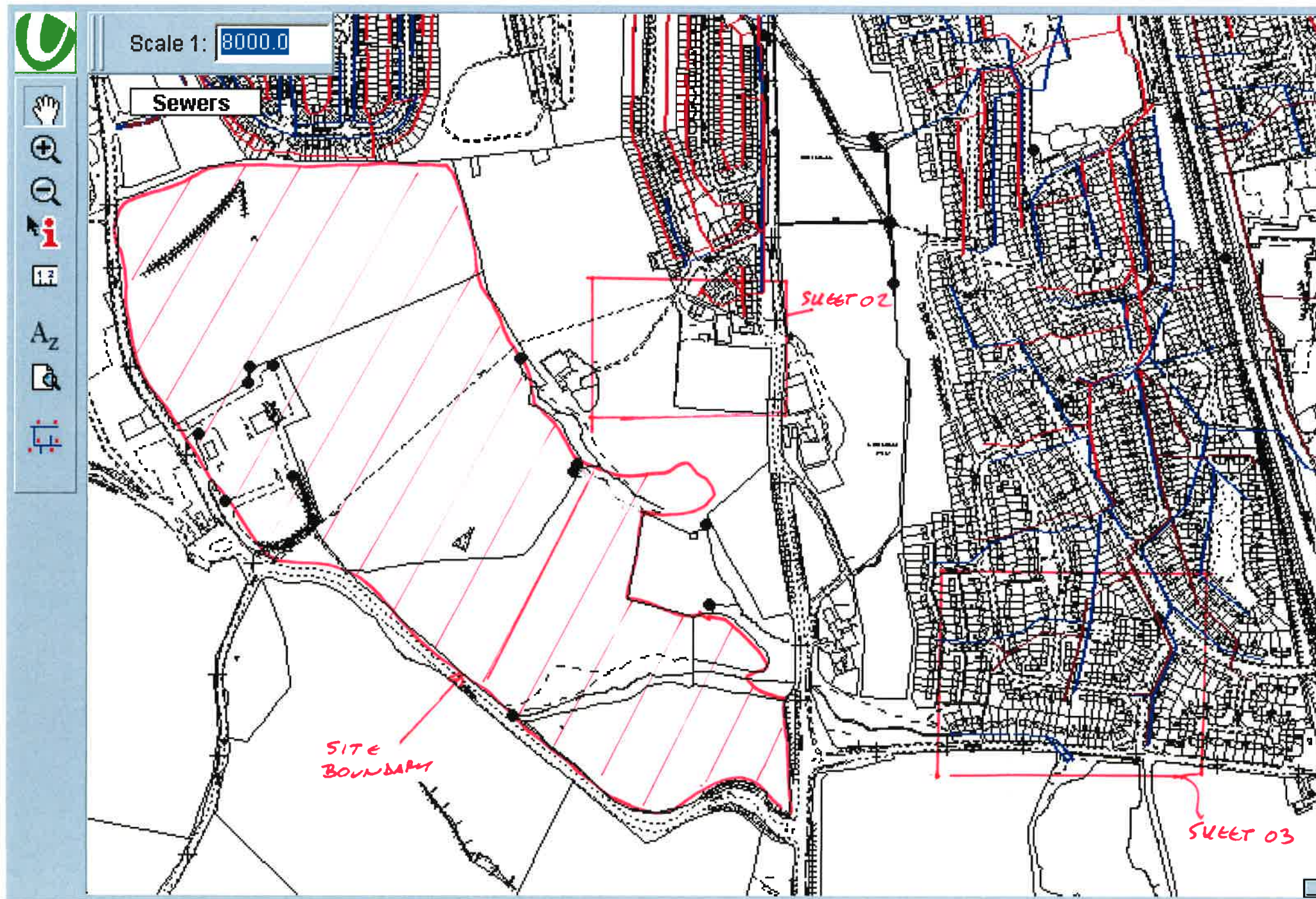
### **SITE LOCATION PLAN**



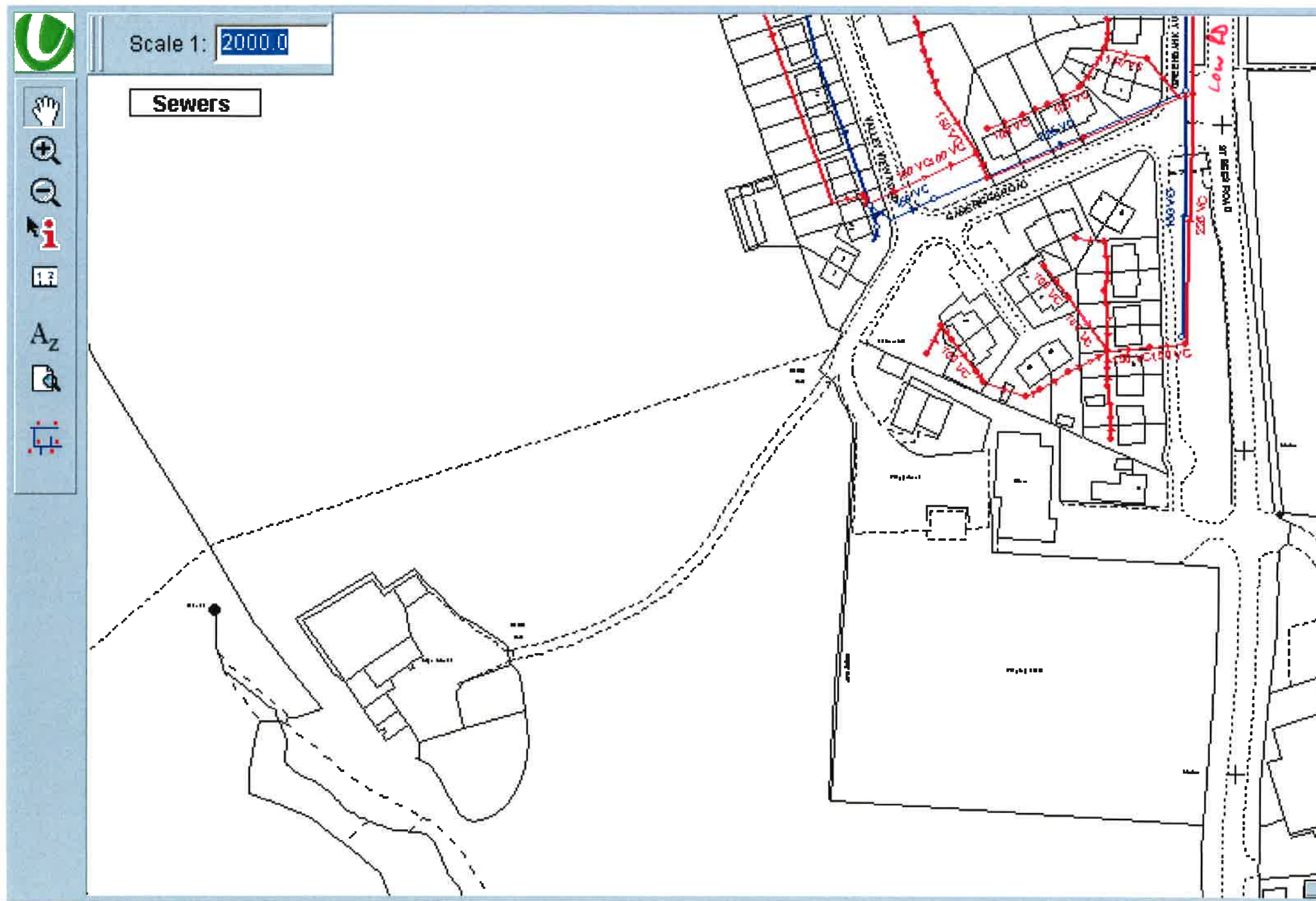
TOWN PLAN

## **APPENDIX 2**

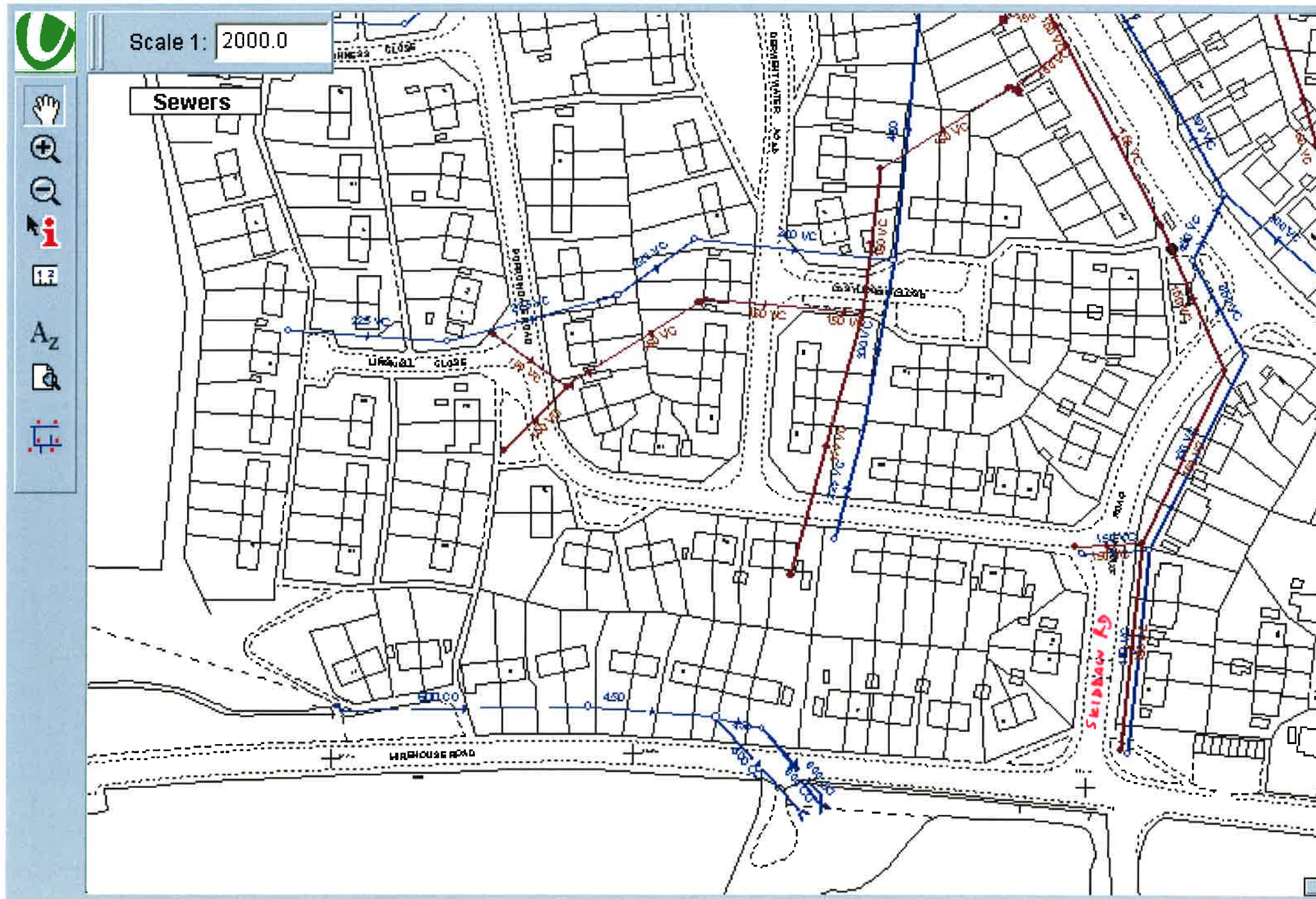
### **UNITED UTILITIES SEWER PLANS**



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APPENDIX 2

EXISTING UU DRAINAGE IN SKIDDAW RD - SHEET 03

## **APPENDIX 3**

### **DRAINAGE CALCULATIONS**

# RUNOFF DRAINAGE CALCULATIONS

## Greenfield Runoff

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Ru

### Greenfield estimation of peak flow rate of runoff

1. Hydrological region (1 – 10) (R)

UK is divided up into 10 hydrological regions reflecting the different flood frequency growth curves.

2. Soil type (1 – 5) (S)

Refer to Wallingford Procedure WRAP map or FSR maps.

3. Catchment size (A)  ha

The size of the gross catchment excluding large parkland areas being allocated as public open space which remain unmodified.

4. Method of greenfield analysis

If catchment area is 200+ ha a full FEH analysis is recommended to obtain a more accurate estimate of greenfield runoff characteristics.

5. Area (A)  ha

Excluding public open space not modified by the proposed development.

6. Annual Rainfall (SAAR)  mm

SAAR – use either SAAR from FSR or AAR from FEH.

7. Soil runoff coefficient (SPR)

SPR value for SOIL – this is not the FSR index class value for SOIL (1 – 5) but its corresponding runoff coefficient (SPR) as follows:

| SOIL | 1    | 2    | 3    | 4    | 5    |
|------|------|------|------|------|------|
| SPR  | 0.10 | 0.30 | 0.37 | 0.47 | 0.53 |

8. Catchment mean annual peak flow (Q<sub>BAR</sub>)  l/s  
 $1000 \times (0.00108(A/100)^{0.89} \cdot SAAR^{1.17} \cdot SPR^{2.17})$

For sites of 50 ha or less, use 50 ha when applying the formula. Subsequently pro-rata the resulting value by the ratio of the site to 50 ha  
*i.e. Q<sub>BAR 50ha</sub> x (area / 50)*

9. Mean annual peak flow per unit area (Q<sub>BAR/A</sub>)  l/s/ha

10. 1yr, 30yr and 100yr peak discharge rate of runoff per unit area

10.1 Q<sub>BAR</sub> x 0.85 Q<sub>1yr</sub>  l/s/ha

GC<sub>30</sub> and GC<sub>100</sub> are the growth curve ratios Q / Q<sub>BAR</sub> for the 30 year and 100 year events for the relevant hydrological region.

10.2 Q<sub>BAR</sub> x GC<sub>30</sub> Q<sub>30yr</sub>  l/s/ha

10.3 Q<sub>BAR</sub> x GC<sub>100</sub> Q<sub>100yr</sub>  l/s/ha

Taking GC<sub>30</sub> = 1.7 and GC<sub>100</sub> = 2.1

Job Title Ruobia - Flow Calculations

## DRAINAGE CALCULATIONS:

$$\text{TOTAL SITE AREA} = 27.7 \text{ Ha}$$

$$\text{POS NOT MODIFIED BY THE DEVELOPMENT} = 3 \text{ Ha}$$

$$\text{GREENFIELD RUNOFF RATE: } 8.25 \text{ l/s/La}$$

$$\therefore \text{Total Flow} = 8.25 \times (27.7 - 3) = 203.8 \text{ l/s}$$

BETTERMENT OF 20% :

$$203.8 \times 0.8 = \underline{163.02 \text{ l/s}} \text{ TOTAL}$$

NOTE, SUBJECT TO INCREASE/  
DECREASE SLIGHTLY DEPENDING  
UPON FINAL POS AREA.

• IN 1:30 YR STORM:

$$Q_{60-30} = 14.03 \text{ l/s/La}$$

$$\therefore 14.03 \times 24.7 = \underline{346.54 \text{ l/s}} \text{ CURRENT RUNOFF IN 1:30 YR STORM}$$

$$\# (163.02 / 346.54) \times 100\% = 47\%, \text{ i.e. } \underline{53\% \text{ REDUCTION IN SW FLOW DURING 1:30 YR STORM}}$$

• IN 1:100 YR STORM:

$$Q_{64-100} = 17.33 \text{ l/s/La}$$

$$\therefore 17.33 \times 24.7 = \underline{428.05 \text{ l/s}} \text{ CURRENT RUNOFF IN 1:100 YR STORM}$$

$$\# (163.02 / 428.05) \times 100\% = 38\%, \text{ i.e. } \underline{62\% \text{ REDUCTION IN SW FLOW DURING 1:100 YR STORM}}$$

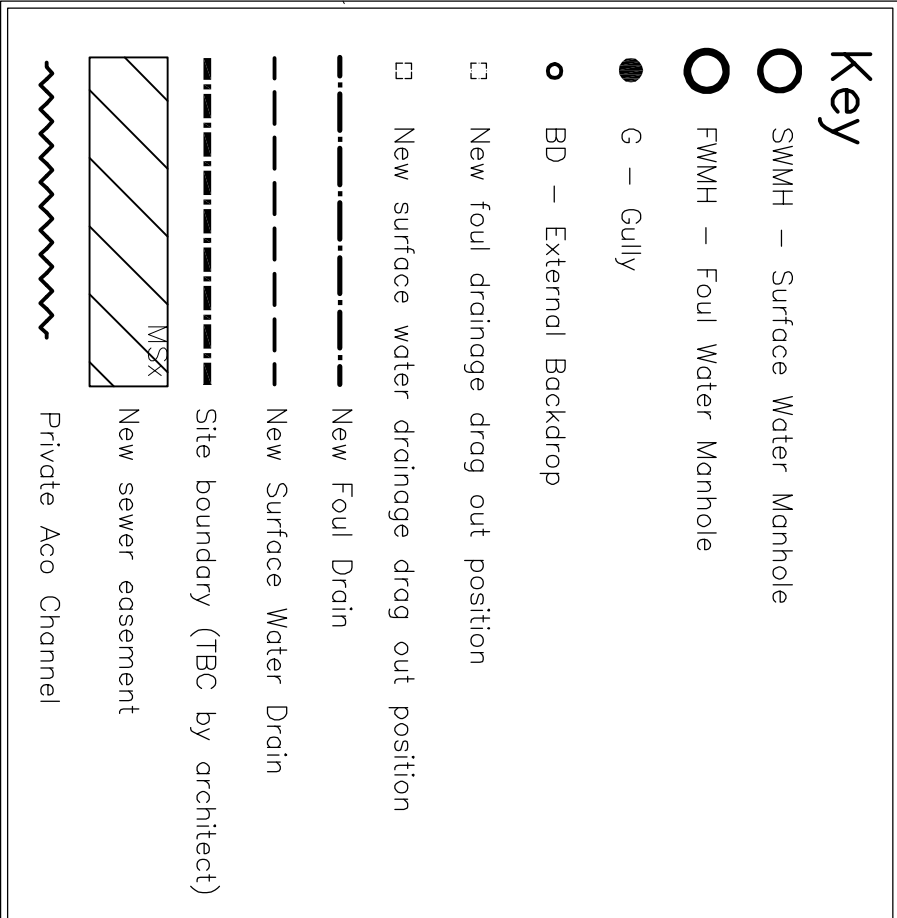
**APPENDIX 4**

**DRAINAGE LAYOUTS**

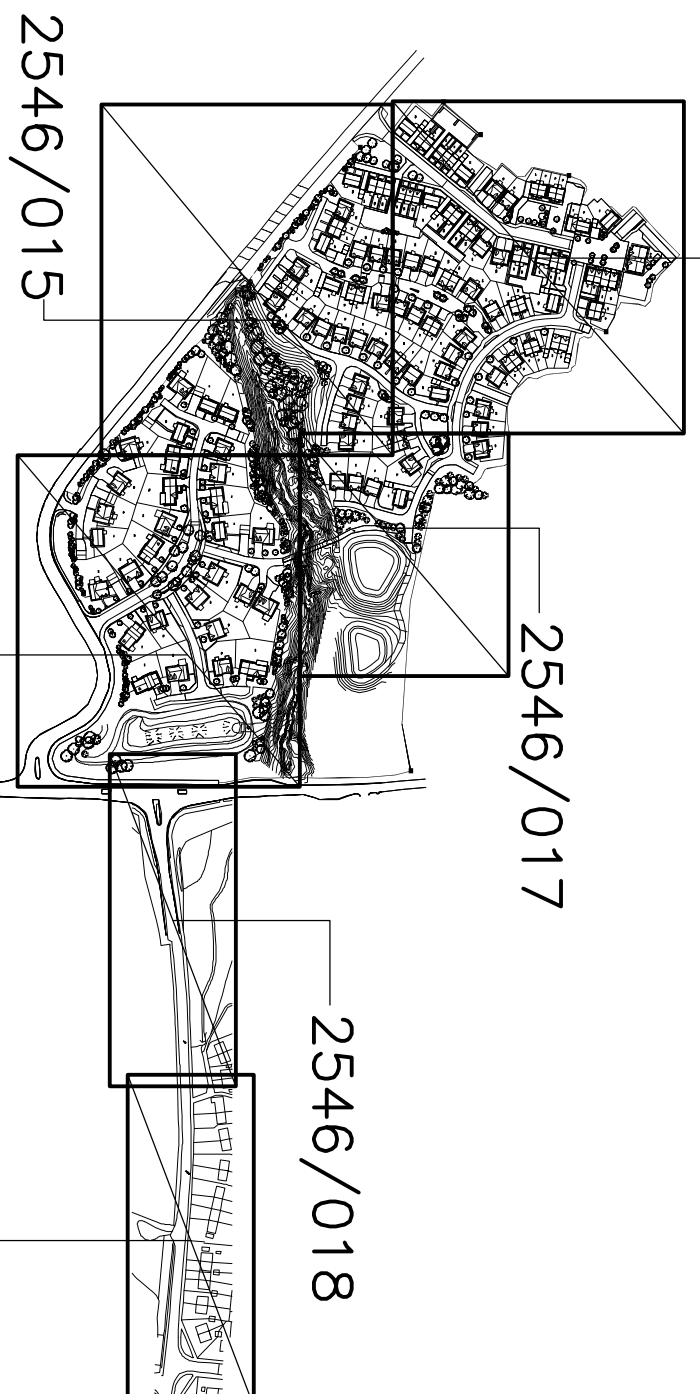


For Levels to SUDs pond refer to drawings 2546/040-041

TREES & BUSHES



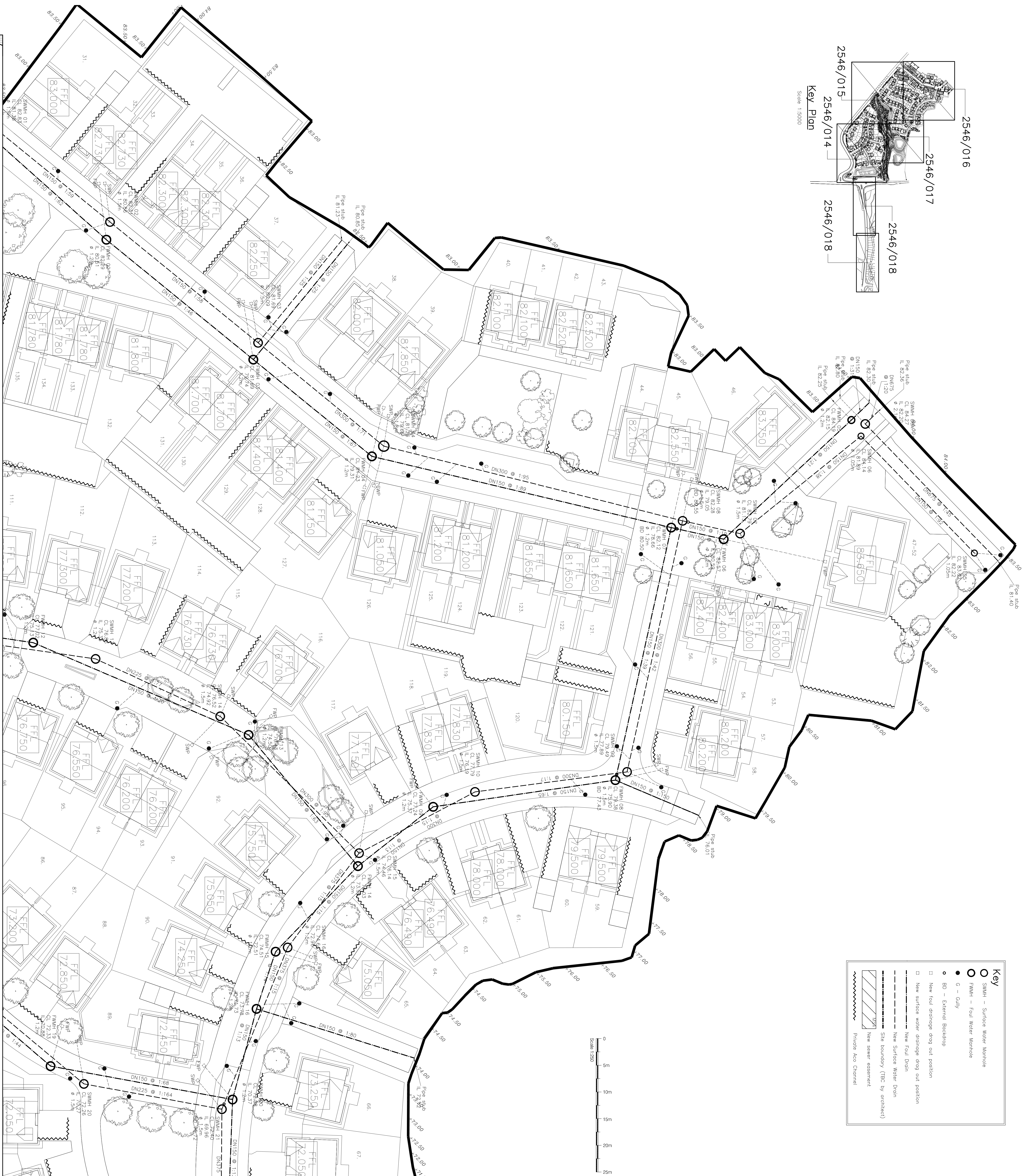
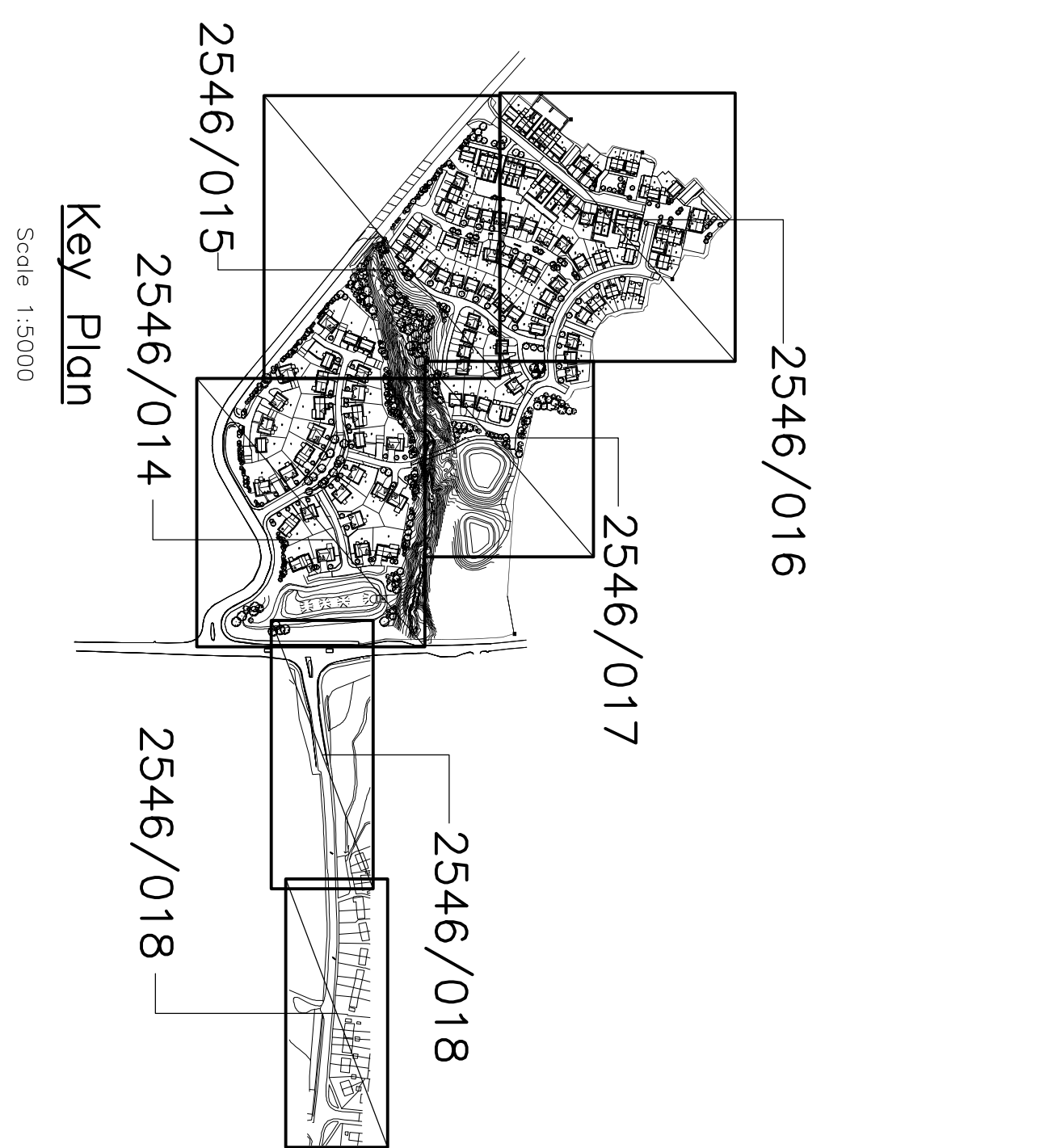
Key Plan  
Scale 1:5000



Drawings subject to S104 & S38 technical approval.

|                                                                                        |  |      |     |    |
|----------------------------------------------------------------------------------------|--|------|-----|----|
| Contract No                                                                            |  | 2546 | 014 | P2 |
| Drawing No                                                                             |  | 014  | P2  |    |
| Checked By                                                                             |  |      |     |    |
| Rev                                                                                    |  |      |     |    |
| Description                                                                            |  |      |     |    |
| Rev                                                                                    |  |      |     |    |
| Drawing Status                                                                         |  |      |     |    |
| Date                                                                                   |  |      |     |    |
| Site boundary revised                                                                  |  |      |     |    |
| P2 JS 16/13                                                                            |  |      |     |    |
| Contract                                                                               |  |      |     |    |
| Rhoda Whitehaven Story Homes                                                           |  |      |     |    |
| Drawing Title                                                                          |  |      |     |    |
| Phase 1A & 1B Drainage Layout                                                          |  |      |     |    |
| 1 OF 5                                                                                 |  |      |     |    |
| Civil & Structural Engineers                                                           |  |      |     |    |
| integra consulting                                                                     |  |      |     |    |
| Sewer Pipes<br>Foundation House<br>63 Fountain Street<br>M20 2EE                       |  |      |     |    |
| Tel : 0161 237 3400                                                                    |  |      |     |    |
| Fax : 0161 237 3635                                                                    |  |      |     |    |
| Email : <a href="mailto:info@integraconsulting.co.uk">info@integraconsulting.co.uk</a> |  |      |     |    |
| Web : <a href="http://www.integraconsulting.co.uk">www.integraconsulting.co.uk</a>     |  |      |     |    |
| Scale 1:250@A0                                                                         |  |      |     |    |
| Drawn JS                                                                               |  |      |     |    |
| Checked RH                                                                             |  |      |     |    |
| Date 04/2013                                                                           |  |      |     |    |



Notes.

- 1 All dimensions are in millimetres unless otherwise stated.
- 2 All levels are in metres unless noted otherwise.
- 3 The drawing is to be used in conjunction with all relevant Architectural and Service Engineers drawings.
- 4 All drainage pipes to be dropped to adequate depth.
- 5 All drainage pipes to be dropped to adequate depth and concrete from 35mm to 100mm.
- 6 All road gutters to have 4500 x 3000 gullies to BSEN 124 with 4500 x 3000 drains to BSEN 124 and 4500 x 3000 drains to BSEN 124 and be of solidified mass to BSEN 124 and be of solidified mass.
- 7 All Manhole covers to be Grade B125 in (solidified) or (solidified) or 4040 in (solidified) mass to BSEN 124 and be of solidified mass.
- 8 Invert levels quoted are exit Inverts.
- 9 Pipes to be in concrete bedding class 2/200. No 100mm or 150mm pipes to be in concrete bedding class 2/200.
- 10 Final attenuation volumes in ponds to be agreed with local authority / statutory bodies.
- 11 All drainage pipes carrying road water to be in concrete, pipes carrying roof DN100 pipes to be in 150 dia.
- 12 All work to be carried out in accordance with the following:
  - (a) – Sewers for Adoption 7th Edition.
  - (b) – Civil Engineering Specification for the Motor Industry EN1245, 2012.
- 13 All RMV's & SW's to have double 14" cover.
- 14 All drainage pipes velocity of 1.0 m/s to be achieved.
- 15 All Sewers must provide a 0.75 m/s velocity for one third design flow where the current velocity is less than 1.0 m/s.
- 16 In 150 where there has been at least 10 connected dwelling units.
- 17 In 60 for up to 9 connected dwelling units.
- 18 PV connection point in Sliddow Road subject to full PV approval. Meter required to route PU approval. Meter may be supplied by local authority.
- 19 All surface water discharge to be restricted to 100% rainfall runoff as follows (subject to local EA approval):
  - 100% rainfall runoff as follows (subject to local EA approval):
  - Central pond 305 1/2
  - 100% rainfall runoff as follows (subject to local EA approval):
- 20 All work to comply with the requirements of BS EN 752.

Drawings subject to S104 & S38 technical approval.

|                                            |            |                             |
|--------------------------------------------|------------|-----------------------------|
| P3                                         | JS         | 96/13 Site boundary revised |
| P2                                         | JS         | 96/13 minor changes         |
| Rev                                        | Drawn Date | Description                 |
| Drawing Status                             |            |                             |
| PLANNING                                   |            |                             |
| Contract                                   |            |                             |
| RHODA                                      |            |                             |
| WHITEHAVEN                                 |            |                             |
| STORY HOMES                                |            |                             |
| Drawing Title                              |            |                             |
| PHASE 1A & 1B                              |            |                             |
| DRAINAGE LAYOUT                            |            |                             |
| 3 OF 5                                     |            |                             |
| integra                                    |            |                             |
| Second Floor                               |            |                             |
| consulting                                 |            |                             |
| MANCHESTER                                 |            |                             |
| Civil & Structural Engineers               |            |                             |
| Tel : 0161 237 3400                        |            |                             |
| Fax : 0161 237 3635                        |            |                             |
| Email : manchester@integraconsulting.co.uk |            |                             |
| Web : www.integraconsulting.co.uk          |            |                             |
| Scales                                     | 1:250&A0   | Date                        |
| Drawn                                      | JS         | 04/20/13                    |
| Checked                                    | PH         |                             |
| Drawing No                                 |            | Rev                         |
| 2546                                       | 016        | P3                          |





Notes.

- 1 All dimensions are in millimetres unless noted
- 2 otherwise.
- 3 All levels are in metres unless noted otherwise.
- 4 This drawing is to be read in conjunction with
- 5 oil relevant Architects and Service Engineers
- 6 drawings.
- 7 All work to be carried out in accordance with the
- 8 following documents:
- 9 (a) – *Specs for Adoption 7th Edition,*
- 10 (b) – *Civil Engineering Specification for the Water*
- 11 *Industry 7th Edition, 2012.*
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2546/005

2546/006

2546/005

OUTLINE PLANNING AREA  
DRAINAGE LAYOUT  
1 OF 3

**integra**  
consulting

Civil &amp; Structural Engineer

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Fox : 0161 237 3635

Web : [www.integraconsulting.co.uk](http://www.integraconsulting.co.uk)

|              |      |
|--------------|------|
| Scales       | Date |
| 1:500 U.N.O. |      |

Contract No

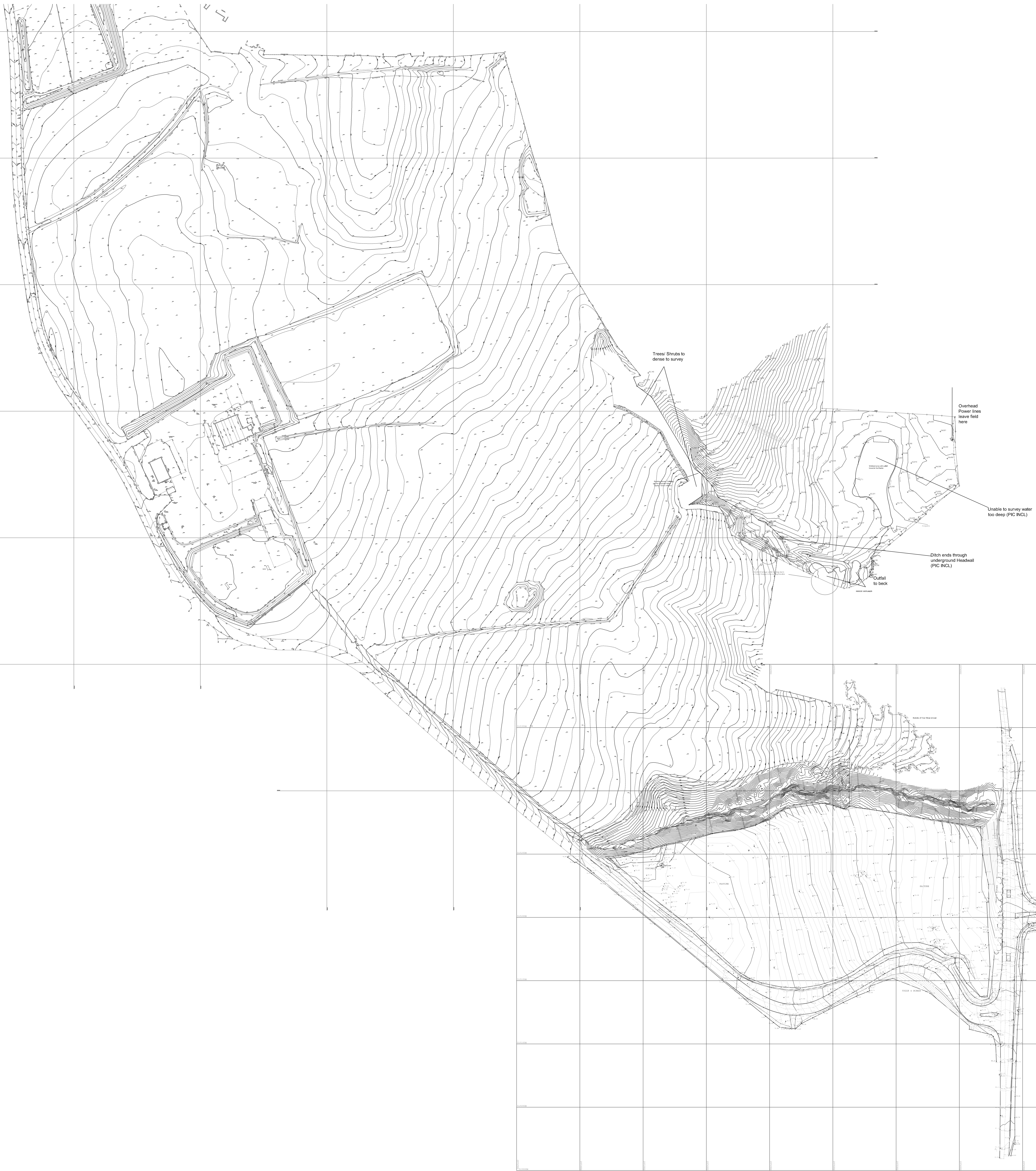
|                                                                                                                                                                                                                                  |      |              |                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--------------|-----------------------|
| P2                                                                                                                                                                                                                               | JIS  | 06/13        | Site boundary revised |
| Drawing Status<br><b>PLANNING</b>                                                                                                                                                                                                |      |              |                       |
| Contract<br>RHODIA<br>WHITEHAVEN<br>STORY HOMES                                                                                                                                                                                  |      |              |                       |
| Drawing Title<br>OUTLINE PLANNING AREA<br>DRAINAGE LAYOUT<br>1 OF 3                                                                                                                                                              |      |              |                       |
| <div> <div>  </div> <div> <p>Second Floor<br/>83 Fountain Street<br/>M2 2ET<br/>Wetherby</p> </div> </div>                                    |      |              |                       |
| Civil & Structural Engineers                                                                                                                                                                                                     |      |              |                       |
| Tel: 0161 237 3400<br>Fax: 0161 237 3635<br>Email: <a href="mailto:marketing@integraconsulting.co.uk">marketing@integraconsulting.co.uk</a><br>Web: <a href="http://www.integraconsulting.co.uk">www.integraconsulting.co.uk</a> |      |              |                       |
| Drawn                                                                                                                                                                                                                            | JIS  | 1:500 U.N.O. | Date                  |
| Checked                                                                                                                                                                                                                          | RH   |              | 04/2013               |
| Contract No                                                                                                                                                                                                                      | 2546 | Drawing No   | 004                   |
|                                                                                                                                                                                                                                  |      |              | P2                    |





**APPENDIX 5**

**TOPOGRAPHICAL SURVEY**



## **APPENDIX 6**

### **PROPOSED SITE MASTERPLAN**



Flood Risk Assessment Addendum Report for Edgehill Phase 3,  
High Road, Whitehaven, Cumbria

---

**Appendix 2**

**Coopers Drawings**

| <u>Drawing No.</u> | <u>Revision</u> | <u>Title</u>                              |
|--------------------|-----------------|-------------------------------------------|
| 7503-PL01-1        | B               | Engineering Layout, Drainage Sheet 1 of 2 |
| 7503-PL01-2        | B               | Engineering Layout, Drainage Sheet 2 of 2 |

| FOUL Network 1 |               |               |           |             |        |                         |       |        |                           |       |
|----------------|---------------|---------------|-----------|-------------|--------|-------------------------|-------|--------|---------------------------|-------|
| Pipe Code      | Diameter (mm) | Gradient (1:) | Pipe Type | Pipe Length | Number | Upstream Manhole Invert | Cover | Number | Downstream Manhole Invert | Cover |
| 1.001          | 150           | 47            | Circular  | 37.368      | F101   | 90.96                   | 92.32 | F102   | 89.17                     | 92.28 |
| 1.001          | 150           | 47            | Circular  | 31.608      | F102   | 90.17                   | 92.08 | F103   | 89.51                     | 91.30 |
| 1.002          | 150           | 47            | Circular  | 15.439      | F103   | 91.30                   | 91.30 | F104   | 89.18                     | 90.92 |
| 1.003          | 150           | 47            | Circular  | 20.891      | F104   | 89.18                   | 90.92 | F105   | 88.74                     | 90.40 |
| 1.004          | 150           | 47            | Circular  | 43.011      | F105   | 88.74                   | 90.40 | F106   | 87.84                     | 89.42 |

| FOUL Network 2 |               |               |           |             |        |                         |       |        |                           |       |
|----------------|---------------|---------------|-----------|-------------|--------|-------------------------|-------|--------|---------------------------|-------|
| Pipe Code      | Diameter (mm) | Gradient (1:) | Pipe Type | Pipe Length | Number | Upstream Manhole Invert | Cover | Number | Downstream Manhole Invert | Cover |
| 1.000          | 150           | 79            | Circular  | 24.918      | F201   | 92.24                   | 93.59 | F202   | 91.88                     | 93.42 |
| 1.001          | 150           | 79            | Circular  | 43.810      | F202   | 91.88                   | 93.42 | F204   | 91.59                     | 93.36 |
| 1.002          | 150           | 79            | Circular  | 25.862      | F204   | 91.59                   | 93.36 | F205   | 91.42                     | 93.01 |
| 1.003          | 150           | 79            | Circular  | 12.801      | F205   | 91.42                   | 93.01 | F206   | 91.33                     | 92.86 |
| 1.004          | 150           | 79            | Circular  | 44.281      | F206   | 91.33                   | 92.86 | F208   | 90.38                     | 92.39 |
| 1.005          | 150           | 79            | Circular  | 49.712      | F208   | 90.38                   | 92.39 | F209   | 90.05                     | 91.86 |
| 1.006          | 150           | 79            | Circular  | 16.694      | F209   | 90.05                   | 91.86 | F210   | 89.94                     | 92.40 |
| 1.007          | 150           | 79            | Circular  | 41.340      | F210   | 89.94                   | 92.40 | F211   | 89.66                     | 92.50 |
| 1.008          | 150           | 79            | Circular  | 18.600      | F211   | 89.66                   | 92.50 | F212   | 89.54                     | 92.40 |
| 1.009          | 150           | 79            | Circular  | 25.549      | F212   | 89.54                   | 92.40 | F213   | 89.37                     | 92.25 |
| 1.010          | 150           | 79            | Circular  | 17.664      | F213   | 89.37                   | 92.25 | F214   | 89.25                     | 92.49 |
| 1.011          | 150           | 79            | Circular  | 18.602      | F214   | 89.25                   | 92.49 | F215   | 89.12                     | 92.80 |
| 1.012          | 150           | 79            | Circular  | 36.550      | F215   | 89.12                   | 92.80 | F216   | 88.85                     | 92.76 |
| 1.013          | 150           | 79            | Circular  | 26.272      | F216   | 88.85                   | 92.76 | F217   | 88.70                     | 91.95 |

| FOUL Network 3 |               |               |           |             |        |                         |       |        |                           |       |
|----------------|---------------|---------------|-----------|-------------|--------|-------------------------|-------|--------|---------------------------|-------|
| Pipe Code      | Diameter (mm) | Gradient (1:) | Pipe Type | Pipe Length | Number | Upstream Manhole Invert | Cover | Number | Downstream Manhole Invert | Cover |
| 1.001          | 150           | 42            | CLAY      | 31.981      | F301   | 94.11                   | 95.45 | F302   | 93.35                     | 94.71 |
| 1.001          | 150           | 42            | CLAY      | 18.721      | F302   | 93.35                   | 94.71 | F303   | 93.29                     | 94.86 |
| 1.002          | 150           | 42            | CLAY      | 21.962      | F303   | 93.29                   | 94.86 | F304   | 93.08                     | 94.23 |
| 1.003          | 150           | 42            | CLAY      | 21.369      | F304   | 93.08                   | 94.23 | F305   | 91.03                     | 93.39 |
| 1.004          | 150           | 42            | CLAY      | 49.841      | F305   | 91.03                   | 93.39 | F306   | 89.74                     | 92.45 |
| 1.005          | 150           | 42            | CLAY      | 19.198      | F306   | 89.74                   | 92.45 | F307   | 89.56                     | 91.43 |
| 1.006          | 150           | 42            | CLAY      | 21.013      | F307   | 89.56                   | 91.43 | F308   | 89.45                     | 90.94 |
| 1.007          | 150           | 42            | CLAY      | 31.714      | F308   | 89.45                   | 90.94 | F309   | 89.27                     | 88.25 |
| 1.008          | 150           | 42            | CLAY      | 16.226      | F309   | 89.27                   | 88.25 | F310   | 89.17                     | 87.51 |
| 1.009          | 150           | 42            | CLAY      | 24.903      | F310   | 89.17                   | 87.51 | F311   | 89.06                     | 86.23 |
| 1.010          | 150           | 42            | CLAY      | 36.361      | F311   | 89.06                   | 86.23 | F312   | 88.97                     | 85.02 |
| 1.011          | 150           | 42            | CLAY      | 29.169      | F312   | 88.97                   | 85.02 | F313   | 88.85                     | 84.24 |
| 1.012          | 150           | 42            | CLAY      | 22.331      | F313   | 88.85                   | 84.24 | F314   | 88.70                     | 83.04 |
| 1.013          | 150           | 42            | CLAY      | 18.983      | F314   | 88.70                   | 83.04 | F315   | 88.55                     | 81.85 |
| 1.014          | 150           | 42            | CLAY      | 26.272      | F315   | 88.55                   | 81.85 | F316   | 88.40                     | 80.65 |

| FOUL Network 4 |               |               |           |             |        |                         |       |        |                           |       |
|----------------|---------------|---------------|-----------|-------------|--------|-------------------------|-------|--------|---------------------------|-------|
| Pipe Code      | Diameter (mm) | Gradient (1:) | Pipe Type | Pipe Length | Number | Upstream Manhole Invert | Cover | Number | Downstream Manhole Invert | Cover |
| 1.001          | 150           | 42            | CLAY      | 25.787      | F401   | 93.37                   | 95.42 | F402   | 93.01                     | 95.47 |
| 1.001          | 150           | 42            | CLAY      | 15.584      | F402   | 93.01                   | 95.47 | F403   | 92.80                     | 95.55 |
| 1.002          | 150           | 42            | CLAY      | 29.324      | F403   | 92.80                   | 95.55 | F404   | 92.50                     | 95.62 |
| 1.003          | 150           | 42            | CLAY      | 45.321      | F404   | 92.50                   | 95.62 | F405   | 92.23                     | 95.69 |
| 1.004          | 150           | 42            | CLAY      | 29.339      | F405   | 92.23                   | 95.69 | F406   | 91.85                     | 95.81 |
| 1.005          | 150           | 42            | CLAY      | 21.823      | F406   | 91.85                   | 95.81 | F407   | 91.50                     | 95.85 |
| 1.006          | 150           | 42            | CLAY      | 20.094      | F407   | 91.50                   | 95.85 | F408   | 91.09                     | 95.85 |
| 1.007          | 150           | 42            | CLAY      | 18.772      | F408   | 91.09                   | 95.85 | F409   | 90.68                     | 95.83 |
| 1.008          | 150           | 42            | CLAY      | 31.122      | F409   | 90.68                   | 95.83 | F410   | 90.21                     | 95.72 |
| 1.009          | 150           | 42            | CLAY      | 23.077      | F410   | 90.21                   | 95.72 | F411   | 89.72                     | 95.62 |
| 1.010          | 150           | 42            | CLAY      | 10.810      | F411   | 89.72                   | 95.62 | F412   | 89.32                     | 95.54 |
| 1.011          | 150           | 42            | CLAY      | 25.480      | F412   | 89.32                   | 95.54 | F413   | 88.81                     | 95.44 |
| 1.012          | 150           | 42            | CLAY      | 36.176      | F413   | 88.81                   | 95.44 | F414   | 88.21                     | 95.34 |
| 1.013          | 150           | 42            | CLAY      | 13.685      | F414   | 88.21                   | 95.34 | F415   | 87.61                     | 95.24 |

| FOUL Network 5 |               |               |           |             |        |                         |       |        |                           |       |
|----------------|---------------|---------------|-----------|-------------|--------|-------------------------|-------|--------|---------------------------|-------|
| Pipe Code      | Diameter (mm) | Gradient (1:) | Pipe Type | Pipe Length | Number | Upstream Manhole Invert | Cover | Number | Downstream Manhole Invert | Cover |
| 1.001          | 150           | 22            | CLAY      | 27.952      | F10    | 82.90                   | 84.25 | F11    | 81.63                     | 82.98 |
| 1.001          | 150           | 22            | CLAY      | 11.593      | F11    | 81.63                   | 82.98 | F12    | 81.42                     | 82.77 |
| 1.002          | 150           | 22            | CLAY      | 29.142      | F12    | 81.42                   | 82.77 | F13    | 81.06                     | 82.88 |
| 1.003          | 150           | 22            | CLAY      | 45.808      | F13    | 81.06                   | 82.88 | F14    | 80.68                     | 82.91 |
| 1.004          | 150           | 22            | CLAY      | 35.224      | F14    | 80.68                   | 82.91 | F15    | 80.24                     | 82.94 |
| 1.005          | 150           | 22            | CLAY      | 35.860      | F15    | 80.24                   | 82.94 | F16    | 79.86                     | 82.98 |
| 1.006          | 150           | 22            | CLAY      | 28.573      | F16    | 79.86                   | 82.98 | F17    | 79.47                     | 82.98 |
| 1.007          | 150           | 22            | CLAY      | 28.384      | F17    | 79.47                   | 82.98 | F18    | 79.08                     | 82.98 |
| 1.008          | 150           | 22            | CLAY      | 31.315      | F18    | 79.08                   | 82.98 | F19    | 78.69                     | 82.98 |
| 1.009          | 150           | 22            | CLAY      | 31.315      | F19    | 78.69                   | 82.98 | F20    | 78.30                     | 82.98 |

| FOUL Network 6 |               |               |           |             |        |                         |       |        |                           |       |
|----------------|---------------|---------------|-----------|-------------|--------|-------------------------|-------|--------|---------------------------|-------|
| Pipe Code      | Diameter (mm) | Gradient (1:) | Pipe Type | Pipe Length | Number | Upstream Manhole Invert | Cover | Number | Downstream Manhole Invert | Cover |
| 1.001          | 150           | 22            | CLAY      | 27.952      | F10    | 82.90                   | 84.25 | F11    | 81.63                     | 82.98 |
| 1.001          | 150           | 22            | CLAY      | 11.593      | F11    | 81.63                   | 82.98 | F12    | 81.42                     | 82.77 |
| 1.002          | 150           | 22            | CLAY      | 29.142      | F12    | 81.42                   | 82.77 | F13    | 81.06                     | 82.88 |
| 1.003          | 150           | 22            | CLAY      | 45.808      | F13    | 81.06                   | 82.88 | F14    | 80.68                     | 82.91 |
| 1.004          | 150           | 22            | CLAY      | 35.224      | F14    | 80.68                   | 82.91 | F15    | 80.24                     | 82.94 |
| 1.005          | 150           | 22            | CLAY      | 35.860      | F15    | 80.24                   | 82.94 | F16    | 79.86                     | 82.98 |
| 1.006          | 150           | 22            | CLAY      | 28.573      | F16    | 79.86                   | 82.98 | F17    | 79.47                     | 82.98 |
| 1.007          | 150           | 22            | CLAY      | 28.384      | F17    | 79.47                   | 82.98 | F18    | 79.08                     | 82.98 |
| 1.008          | 150           | 22            | CLAY      | 31.315      | F18    | 79.08                   | 82.98 | F19    | 78.69                     | 82.98 |
| 1.009          | 150           | 22            | CLAY      | 31.315      | F19    | 78.69                   | 82.98 | F20    | 78.30                     | 82.98 |

| FOUL Network 7 |               |               |           |             |        |                         |       |        |                           |       |
|----------------|---------------|---------------|-----------|-------------|--------|-------------------------|-------|--------|---------------------------|-------|
| Pipe Code      | Diameter (mm) | Gradient (1:) | Pipe Type | Pipe Length | Number | Upstream Manhole Invert | Cover | Number | Downstream Manhole Invert | Cover |
| 1.001          | 150           | 22            | CLAY      | 27.952      | F10    | 82.90                   | 84.25 | F11    | 81                        |       |



| STORM Network 1 |               |               |           |             |        |                         |       |        |                           |       |        |                         |       |        |                           |       |        |
|-----------------|---------------|---------------|-----------|-------------|--------|-------------------------|-------|--------|---------------------------|-------|--------|-------------------------|-------|--------|---------------------------|-------|--------|
| Pipe Code       | Diameter (mm) | Gradient (1:) | Pipe Type | Pipe Length | Number | Upstream Manhole Invert | Cover | Number | Downstream Manhole Invert | Cover | Number | Upstream Manhole Invert | Cover | Number | Downstream Manhole Invert | Cover | Number |
| 1.000           | 225           | 70            | CLAY      | 11.032      | S301   | 90.92                   | 92.72 | S302   | 90.76                     | 92.93 |        |                         |       |        |                           |       |        |
| 1.001           | 225           | 150           | CLAY      | 47.391      | S302   | 90.76                   | 92.93 | S303   | 90.45                     | 92.35 |        |                         |       |        |                           |       |        |
| 1.002           | 225           | 150           | CLAY      | 25.774      | S303   | 90.45                   | 92.35 | S304   | 90.27                     | 92.22 |        |                         |       |        |                           |       |        |
| 1.003           | 300           | 42            | CLAY      | 27.917      | S304   | 90.20                   | 92.22 | S305   | 89.53                     | 91.33 |        |                         |       |        |                           |       |        |
| 1.004           | 300           | 53            | CLAY      | 17.748      | S305   | 89.53                   | 91.33 | S306   | 89.07                     | 91.07 |        |                         |       |        |                           |       |        |
| 1.005           | 300           | 40            | CLAY      | 22.431      | S306   | 89.20                   | 91.07 | S307   | 88.63                     | 90.51 |        |                         |       |        |                           |       |        |
| 1.006           | 300           | 50            | CLAY      | 20.291      | S307   | 88.63                   | 90.51 | S308   | 88.50                     | 90.42 |        |                         |       |        |                           |       |        |
| 1.007           | 300           | 24            | CLAY      | 26.839      | S308   | 88.50                   | 90.42 | S1     | 87.37                     | 89.35 |        |                         |       |        |                           |       |        |
| 1.008           | 300           | 44            | CONC      | 28.889      | S1     | 87.38                   | 89.35 | S3     | 86.73                     | 89.00 |        |                         |       |        |                           |       |        |
| 1.009           | 300           | 42            | CONC      | 101.842     | S3     | 86.73                   | 89.00 | S5     | 85.98                     | 87.61 |        |                         |       |        |                           |       |        |
| 1.010           | 675           | 48            | CONC      | 61.448      | S5     | 83.52                   | 87.61 | S11    | 82.23                     | 84.81 |        |                         |       |        |                           |       |        |
| 1.011           | 675           | 408           | CONC      | 11.781      | S11    | 82.23                   | 84.81 | S12    | 82.23                     | 84.81 |        |                         |       |        |                           |       |        |
| 1.012           | 675           | 45            | CONC      | 46.516      | S12    | 82.20                   | 84.27 | S13    | 81.17                     | 83.41 |        |                         |       |        |                           |       |        |
| 1.013           | 675           | 67            | CONC      | 24.120      | S13    | 81.17                   | 83.41 | S15    | 80.81                     | 82.95 |        |                         |       |        |                           |       |        |
| 1.014           | 675           | 61            | CONC      | 12.639      | S15    | 80.81                   | 82.95 | S16    | 80.56                     | 82.90 |        |                         |       |        |                           |       |        |
| 1.015           | 675           | 79            | CONC      | 29.984      | S16    | 80.56                   | 82.90 | S20    | 80.18                     | 83.05 |        |                         |       |        |                           |       |        |
| 1.016           | 750           | 78            | CONC      | 46.235      | S20    | 77.94                   | 83.05 | S21    | 77.35                     | 79.52 |        |                         |       |        |                           |       |        |
| 1.017           | 750           | 81            | CONC      | 34.347      | S21    | 75.85                   | 79.52 | S23    | 75.44                     | 77.69 |        |                         |       |        |                           |       |        |
| 1.018           | 750           | 48            | CONC      | 20.718      | S23    | 73.19                   | 77.69 | S24    | 72.76                     | 76.00 |        |                         |       |        |                           |       |        |
| 1.019           | 750           | 88            | CONC      | 13.163      | S24    | 70.76                   | 76.00 | S25    | 70.56                     | 73.50 |        |                         |       |        |                           |       |        |
| 1.020           | 750           | 43            | CONC      | 29.678      | S25    | 68.25                   | 73.50 | S26    | 67.87                     | 70.81 |        |                         |       |        |                           |       |        |
| 1.021           | 750           | 50            | CONC      | 71.017      | S26    | 65.80                   | 70.81 | S27    | 64.18                     | 66.50 |        |                         |       |        |                           |       |        |
| 1.022           | 750           | 50            | CONC      | 86.296      | S27    | 64.18                   | 66.50 | S28    | 64.18                     | 66.50 |        |                         |       |        |                           |       |        |
| 1.023           | 450           | 24            | CONC      | 46.944      | S28    | 62.99                   | 64.80 | S29    | 61.06                     | 62.75 |        |                         |       |        |                           |       |        |
| 1.024           | 450           | 190           | CONC      | 16.932      | S29    | 59.47                   | 62.75 | S30    | 59.30                     | 60.25 |        |                         |       |        |                           |       |        |
| 2.000           | 225           | 21            | CLAY      | 6.543       | S2     | 87.24                   | 89.32 | S3     | 86.92                     | 89.00 |        |                         |       |        |                           |       |        |
| 3.000           | 225           | 62            | CLAY      | 58.375      | S28    | 92.33                   | 94.05 | S29    | 91.38                     | 93.11 |        |                         |       |        |                           |       |        |
| 3.001           | 300           | 168           | CLAY      | 43.117      | S29    | 91.31                   | 93.11 | S30    | 91.05                     | 93.10 |        |                         |       |        |                           |       |        |
| 3.002           | 300           | 168           | CLAY      | 57.623      | S30    | 91.05                   | 93.10 | S31    | 90.71                     | 92.63 |        |                         |       |        |                           |       |        |
| 3.003           | 450           | 398           | CONC      | 28.230      | S231   | 88.32                   | 92.63 | S232   | 88.25                     | 92.41 |        |                         |       |        |                           |       |        |
| 3.004           | 450           | 397           | CONC      | 19.489      | S232   | 88.25                   | 92.41 | S233   | 88.20                     | 92.37 |        |                         |       |        |                           |       |        |
| 3.005           | 450           | 403           | CONC      | 19.325      | S233   | 88.20                   | 92.37 | S234   | 88.15                     | 91.87 |        |                         |       |        |                           |       |        |
| 3.006           | 450           | 32            | CONC      | 44.143      | S234   | 88.92                   | 92.37 | S235   | 88.54                     | 92.41 |        |                         |       |        |                           |       |        |
| 4.000           | 450           | 23            | CLAY      | 4.000       | S235   | 88.54                   | 92.41 | S236   | 88.33                     | 91.33 |        |                         |       |        |                           |       |        |
| 4.001           | 225           | 22            | CLAY      | 15.187      | S202   | 92.80                   | 94.33 | S203   | 91.50                     | 93.56 |        |                         |       |        |                           |       |        |
| 4.002           | 450           | 77            | CONC      | 10.803      | S203   | 91.50                   | 93.56 | S204   | 90.86                     | 93.31 |        |                         |       |        |                           |       |        |
| 4.003           | 450           | 82            | CONC      | 26.880      | S204   | 90.86                   | 93.31 | S205   | 90.34                     | 92.29 |        |                         |       |        |                           |       |        |
| 4.004           | 450           | 168           | CONC      | 43.275      | S205   | 90.34                   | 92.29 | S206   | 90.08                     | 92.25 |        |                         |       |        |                           |       |        |
| 4.005           | 450           | 103           | CONC      | 36.869      | S206   | 89.78                   | 92.25 | S207   | 89.12                     | 91.78 |        |                         |       |        |                           |       |        |
| 4.006           | 450           | 78            | CONC      | 10.867      | S212   | 89.12                   | 91.78 | S214   | 89.66                     | 91.78 |        |                         |       |        |                           |       |        |
| 4.007           | 450           | 400           | CONC      | 46.819      | S214   | 89.12                   | 91.78 | S215   | 89.01                     | 92.53 |        |                         |       |        |                           |       |        |
| 4.008           | 450           | 401           | CONC      | 25.673      | S215   | 89.01                   | 92.53 | S216   | 88.56                     | 92.37 |        |                         |       |        |                           |       |        |
| 4.009           | 450           | 401           | CONC      | 18.880      | S220   | 88.96                   | 92.37 | S221   | 88.89                     | 92.29 |        |                         |       |        |                           |       |        |
| 4.010           | 450           | 398           | CONC      | 17.517      | S221   | 88.89                   | 92.29 | S222   | 88.85                     | 92.55 |        |                         |       |        |                           |       |        |
| 4.011           | 450           | 400           | CONC      | 54.882      | S222   | 88.85                   | 92.55 | S223   | 88.71                     | 92.71 |        |                         |       |        |                           |       |        |
| 4.012           | 450           | 400           | CONC      | 24.003      | S223   | 88.71                   | 92.71 | S224   | 88.65                     | 92.06 |        |                         |       |        |                           |       |        |
| 4.013           | 450           | 53            | CONC      | 51.144      | S224   | 88.65                   | 92.06 | S225   | 87.88                     | 90.80 |        |                         |       |        |                           |       |        |
| 4.014           | 450           | 49            | CONC      | 18.974      | S225   | 87.88                   | 90.80 | S226   | 87.29                     | 90.12 |        |                         |       |        |                           |       |        |
| 4.015           | 450           | 279           | CONC      | 19.892      | S226   | 87.29                   | 90.12 | S227   | 87.22                     | 89.64 |        |                         |       |        |                           |       |        |
| 4.016           | 450           | 127           | CONC      | 38.358      | S227   | 87.22                   | 89.64 | S228   | 86.92                     | 89.37 |        |                         |       |        |                           |       |        |
| 5.000           | 225           | 31            | CLAY      | 36.331      | S207   | 91.94                   | 93.66 | S211   | 90.75                     | 92.45 |        |                         |       |        |                           |       |        |
| 5.001           | 300           | 68            | CLAY      | 56.048      | S211   | 90.68                   | 92.45 | S212   | 89.85                     | 91.78 |        |                         |       |        |                           |       |        |
| 6.000           | 225           | 15            | CLAY      | 38.075      | S208   | 92.32                   | 94.24 | S209   | 91.55                     | 93.25 |        |                         |       |        |                           |       |        |
| 6.001           | 300           | 80            | CLAY      | 20.987      | S209   | 91.47                   | 93.20 | S210   | 91.21                     | 92.94 |        |                         |       |        |                           |       |        |
| 6.002           | 300           | 88            | CLAY      | 47.234      | S210   | 91.21                   | 92.94 | S211   | 90.68                     | 92.45 |        |                         |       |        |                           |       |        |
| 7.000           | 225           | 11            | CLAY      | 10.869      | S213   | 90.77                   | 92.50 | S214   | 89.80                     | 92.15 |        |                         |       |        |                           |       |        |
| 8.000           | 225           | 80            | CLAY      | 9.984       | S216   | 91.47                   | 93.20 | S217   | 91.35                     | 93.40 |        |                         |       |        |                           |       |        |
| 8.001           | 300           | 41            | CLAY      | 37.117      | S217   | 91.28                   | 93.40 | S218   | 90.37                     | 92.17 |        |                         |       |        |                           |       |        |
| 8.002           | 300           | 92            | CLAY      | 46.345      | S218   | 90.37                   | 92.17 | S219   | 89.86                     | 91.66 |        |                         |       |        |                           |       |        |
| 8.003           | 300           | 41            | CLAY      | 21.676      | S219   | 89.86                   | 91.66 | S220   | 89.33                     | 92.37 |        |                         |       |        |                           |       |        |
| 9.000           | 225           | 70            | CLAY      | 21.381      | S6     | 84.36                   | 86.14 | S7     | 84.06                     | 85.84 |        |                         |       |        |                           |       |        |
| 9.001           | 225           | 68            | CLAY      | 25.623      | S7     | 84.06                   | 85.84 | S8     | 83.68                     | 85.46 |        |                         |       |        |                           |       |        |
| 9.002           | 225           | 72            | CLAY      | 24.280      | S8     | 83.68                   | 85.46 | S9     | 83.35                     | 85.12 |        |                         |       |        |                           |       |        |
| 9.003           | 300           | 102           | CLAY      | 46.602      | S9     | 83.27                   | 85.12 | S10    | 82.81                     | 84.55 |        |                         |       |        |                           |       |        |
| 9.004           | 300           | 240           | CLAY      | 50.347      | S10    | 82.81                   | 84.55 | S11    | 82.60                     | 84.81 |        |                         |       |        |                           |       |        |
| 10.000          | 225           | 15            | CLAY      | 21.739      | S14A   | 84.12                   | 85.85 | S14    | 82.69                     | 84.40 |        |                         |       |        |                           |       |        |
| 10.001          | 225           | 20            | CLAY      | 28.254      | S14    | 82.67                   | 84.40 | S15    | 81.26                     | 82.95 |        |                         |       |        |                           |       |        |
| 11.000          | 225           | 170           | CLAY      | 13.070      | S17    | 83.68                   | 85.45 | S18    | 83.61                     | 85.03 |        |                         |       |        |                           |       |        |
| 11.001          | 450           | 31            | CONC      | 27.963      | S18    | 83.38                   | 85.03 | S19    | 82.48                     | 84.50 |        |                         |       |        |                           |       |        |
| 11.002          | 450           | 26            | CONC      | 27.828      | S19    | 81.48                   | 84.50 | S20    | 80.41                     | 83.05 |        |                         |       |        |                           |       |        |
| 12.000          | 225           | 70            | CLAY      | 43.344      | S101   | 93.82                   | 95.42 | S102   | 93.18                     | 95.06 |        |                         |       |        |                           |       |        |
| 12.001          | 225           | 54            | CLAY      | 34.363      | S102   | 93.18                   | 95.06 | S103   | 92.54                     | 94.84 |        |                         |       |        |                           |       |        |
| 12.002          | 225           | 168           | CLAY      | 44.803      | S103   | 90.71                   | 93.94 | S104   | 90.45                     | 92.23 |        |                         |       |        |                           |       |        |
| 12.003          | 300           | 159           | CLAY      | 28.940      | S104   | 90.37                   | 92.23 | S105   | 90.16                     | 91.82 |        |                         |       |        |                           |       |        |
| 12.004          | 300           | 24            | CLAY      | 21.988      | S105   | 90.16                   | 91.82 | S106   | 89.27                     | 90.96 |        |                         |       |        |                           |       |        |
| 12.005          | 300           | 17            | CLAY      | 16.892      | S106   | 89.27                   | 90.96 | S120   | 88.25                     | 89.83 |        |                         |       |        |                           |       |        |
| 12.006          | 450           | 388           | CONC      | 20.323      | S120   | 88.70                   | 89.83 | S121   | 88.65                     | 89.45 |        |                         |       |        |                           |       |        |
| 12.007          | 450           | 391           | CONC      | 34.790      | S121   | 84.86                   | 86.45 | S122   | 84.77                     | 86.09 |        |                         |       |        |                           |       |        |
| 12.008          | 450           | 409           | CONC      | 35.143      | S122   | 83.80                   | 86.09 | S129   | 83.51                     | 86.22 |        |                         |       |        |                           |       |        |
| 12.009          | 450           | 404           | CONC      | 26.368      | S129   | 83.51                   | 86.22 | S18    | 83.38                     | 85.03 |        |                         |       |        |                           |       |        |
| 13.000          | 225           | 32            | CLAY      | 41.136      | S107   | 96.59                   | 98.00 | S108   | 95.30                     | 96.72 |        |                         |       |        |                           |       |        |
| 13.001          | 225           | 32            | CLAY      | 38.630      | S108   | 95.30                   | 96.72 | S109   | 94.20                     | 95.61 |        |                         |       |        |                           |       |        |
| 13.002          | 225           | 28            | CLAY      | 34.499      | S109   | 94.20                   | 95.61 | S110   | 92.97                     | 94.71 |        |                         |       |        |                           |       |        |
| 13.003          | 300           | 150           | CLAY      | 21.353      | S110   | 92.89                   | 94.71 | S111   | 92.75                     | 94.80 |        |                         |       |        |                           |       |        |
| 13.004          | 300           | 88            | CLAY      | 10.652      | S111   | 92.75                   | 94.80 | S115   | 92.57                     | 94.80 |        |                         |       |        |                           |       |        |
| 13.005          | 300           | 21            | CLAY      | 21.223      | S112   | 92.97                   | 94.80 | S116   | 92.73                     | 94.81 |        |                         |       |        |                           |       |        |
| 13.006          | 450           | 81            | CONC      | 40.909      | S116   | 91.83                   | 93.51 | S117   | 90.80                     | 92.71 |        |                         |       |        |                           |       |        |
| 13.007          | 450           | 81            | CONC      | 22.496      | S117   | 90.80                   | 92.71 | S120   | 89.35                     | 91.26 |        |                         |       |        |                           |       |        |
| 13.008          | 450           | 102           | CONC      | 32.850      | S120   | 89.35                   | 91.26 | S121   | 89.17                     | 91.17 |        |                         |       |        |                           |       |        |
| 13.009          | 450           | 139           | CONC      | 25.532      | S121   | 88.35                   | 90.91 | S120   | 88.10                     | 89.82 |        |                         |       |        |                           |       |        |
| 14.000          | 225           | 101           | CLAY      | 31.879      | S13    | 85.14                   | 86.34 | S13    | 84.78                     | 85.93 |        |                         | </    |        |                           |       |        |

Flood Risk Assessment Addendum Report for Edgehill Phase 3,  
High Road, Whitehaven, Cumbria

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**Appendix 3**

**MicroDrainage Calculations**

MicroDrainage calculations (Detailed Design)

|                                                  |                                          |                                                                                     |
|--------------------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------|
| Coopers                                          |                                          | Page 1                                                                              |
| Park House<br>Sandpiper Court<br>Chester CH4 9QU | EDGEHILL PHASE 2<br>CUMBRIA<br>SW Design |  |
| Date 01/05/2019                                  | Designed by Coopers                      |                                                                                     |
| File 7503 3A + Planning.MDX                      | Checked by                               |                                                                                     |
| Micro Drainage                                   | Network 2018.1.1                         |                                                                                     |

### STORM SEWER DESIGN by the Modified Rational Method

#### Design Criteria for Phase 2+3a new layout 21.3.5.SWS

Pipe Sizes Phase 2+3a new layout 21.3.5 Manhole Sizes Phase 2+3a new layout 21.3.5

#### FSR Rainfall Model - England and Wales

|                                      |        |                                       |       |
|--------------------------------------|--------|---------------------------------------|-------|
| Return Period (years)                | 2      | PIMP (%)                              | 100   |
| M5-60 (mm)                           | 16.000 | Add Flow / Climate Change (%)         | 0     |
| Ratio R                              | 0.268  | Minimum Backdrop Height (m)           | 0.000 |
| Maximum Rainfall (mm/hr)             | 0      | Maximum Backdrop Height (m)           | 0.000 |
| Maximum Time of Concentration (mins) | 30     | Min Design Depth for Optimisation (m) | 1.550 |
| Foul Sewage (l/s/ha)                 | 0.000  | Min Vel for Auto Design only (m/s)    | 1.00  |
| Volumetric Runoff Coeff.             | 0.750  | Min Slope for Optimisation (1:X)      | 400   |

Designed with Level Soffits

#### Network Design Table for Phase 2+3a new layout 21.3.5.SWS

# - Indicates pipe length does not match coordinates

| PN    | Length<br>(m) | Fall<br>(m) | Slope<br>(1:X) | I.Area<br>(ha) | T.E.<br>(mins) | Base<br>Flow (l/s) | k<br>(mm) | HYD<br>SECT | DIA<br>(mm) | Section Type | Auto<br>Design                                                                        |
|-------|---------------|-------------|----------------|----------------|----------------|--------------------|-----------|-------------|-------------|--------------|---------------------------------------------------------------------------------------|
| 1.000 | 11.032        | 0.158       | 69.8           | 0.087          | 5.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |  |
| 1.001 | 47.292        | 0.315       | 150.1          | 0.156          | 0.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |  |
| 1.002 | 25.773        | 0.172       | 149.8          | 0.075          | 0.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |  |
| 1.003 | 27.917        | 0.665       | 42.0           | 0.048          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |  |
| 1.004 | 17.748        | 0.338       | 52.5           | 0.060          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |  |
| 1.005 | 22.431        | 0.565       | 39.7           | 0.080          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |  |
| 1.006 | 20.291        | 0.135       | 150.3          | 0.102          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |  |
| 1.007 | 26.839        | 1.123       | 23.9           | 0.108          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |  |
| 1.008 | 28.859        | 0.650       | 44.4           | 0.073          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |  |
| 2.000 | 6.543         | 0.317       | 20.6           | 0.000          | 5.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |  |
| 1.009 | 101.942       | 0.735       | 138.7          | 0.099          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |  |
| 3.000 | 58.375        | 0.945       | 61.8           | 0.104          | 5.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |  |

#### Network Results Table

| PN    | Rain<br>(mm/hr) | T.C.<br>(mins) | US/IL<br>(m) | Σ I.Area<br>(ha) | Σ Base<br>Flow (l/s) | Foul<br>(l/s) | Add Flow<br>(l/s) | Vel<br>(m/s) | Cap<br>(l/s) | Flow<br>(l/s) |
|-------|-----------------|----------------|--------------|------------------|----------------------|---------------|-------------------|--------------|--------------|---------------|
| 1.000 | 0.00            | 5.12           | 90.920       | 0.087            | 0.0                  | 0.0           | 0.0               | 1.57         | 62.3         | 0.0           |
| 1.001 | 0.00            | 5.86           | 90.762       | 0.243            | 0.0                  | 0.0           | 0.0               | 1.06         | 42.3         | 0.0           |
| 1.002 | 0.00            | 6.26           | 90.447       | 0.318            | 0.0                  | 0.0           | 0.0               | 1.07         | 42.4         | 0.0           |
| 1.003 | 0.00            | 6.45           | 90.200       | 0.366            | 0.0                  | 0.0           | 0.0               | 2.43         | 172.0        | 0.0           |
| 1.004 | 0.00            | 6.59           | 89.535       | 0.426            | 0.0                  | 0.0           | 0.0               | 2.17         | 153.7        | 0.0           |
| 1.005 | 0.00            | 6.74           | 89.197       | 0.506            | 0.0                  | 0.0           | 0.0               | 2.50         | 176.9        | 0.0           |
| 1.006 | 0.00            | 7.00           | 88.632       | 0.608            | 0.0                  | 0.0           | 0.0               | 1.28         | 90.5         | 0.0           |
| 1.007 | 0.00            | 7.14           | 88.497       | 0.716            | 0.0                  | 0.0           | 0.0               | 3.23         | 228.3        | 0.0           |
| 1.008 | 0.00            | 7.34           | 87.376       | 0.789            | 0.0                  | 0.0           | 0.0               | 2.37         | 167.2        | 0.0           |
| 2.000 | 0.00            | 5.04           | 87.242       | 0.000            | 0.0                  | 0.0           | 0.0               | 2.89         | 115.0        | 0.0           |
| 1.009 | 0.00            | 8.62           | 86.726       | 0.888            | 0.0                  | 0.0           | 0.0               | 1.33         | 94.2         | 0.0           |
| 3.000 | 0.00            | 5.58           | 92.328       | 0.104            | 0.0                  | 0.0           | 0.0               | 1.67         | 66.3         | 0.0           |

|                             |                     |                                                                                     |
|-----------------------------|---------------------|-------------------------------------------------------------------------------------|
| Coopers                     |                     | Page 2                                                                              |
| Park House                  | EDGEHILL PHASE 2    |  |
| Sandpiper Court             | CUMBRIA             |                                                                                     |
| Chester CH4 9QU             | SW Design           |                                                                                     |
| Date 01/05/2019             | Designed by Coopers |                                                                                     |
| File 7503 3A + Planning.MDX | Checked by          |                                                                                     |
| Micro Drainage              | Network 2018.1.1    |                                                                                     |

Network Design Table for Phase 2+3a new layout 21.3.5.SWS

| PN    | Length<br>(m) | Fall<br>(m) | Slope<br>(1:X) | I.Area<br>(ha) | T.E.<br>(mins) | Base<br>Flow (l/s) | k<br>(mm) | HYD<br>SECT | DIA<br>(mm) | Section Type | Auto<br>Design                                                                        |
|-------|---------------|-------------|----------------|----------------|----------------|--------------------|-----------|-------------|-------------|--------------|---------------------------------------------------------------------------------------|
| 3.001 | 43.118        | 0.257       | 167.8          | 0.168          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |    |
| 3.002 | 57.818        | 0.344       | 168.1          | 0.141          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |    |
| 3.003 | 28.230        | 0.071       | 397.6          | 0.125          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |    |
| 3.004 | 19.466        | 0.049       | 397.3          | 0.041          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |    |
| 3.005 | 19.325        | 0.048       | 402.6          | 0.021          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |    |
| 4.000 | 20.439        | 0.896       | 22.8           | 0.071          | 5.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |    |
| 4.001 | 15.197        | 0.702       | 21.6           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |    |
| 4.002 | 10.803        | 0.140       | 77.2           | 0.136          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |    |
| 4.003 | 26.856        | 0.519       | 51.7           | 0.125          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |    |
| 4.004 | 43.276        | 0.258       | 167.7          | 0.031          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |    |
| 4.005 | 39.069        | 0.381       | 102.5          | 0.116          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |    |
| 5.000 | 36.031        | 1.181       | 30.5           | 0.187          | 5.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |    |
| 6.000 | 39.674        | 0.965       | 41.1           | 0.134          | 5.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |    |
| 6.001 | 20.987        | 0.262       | 80.1           | 0.053          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |    |
| 6.002 | 47.235        | 0.534       | 88.5           | 0.102          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |    |
| 5.001 | 56.048        | 0.827       | 67.8           | 0.191          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |  |
| 4.006 | 10.667        | 0.137       | 77.9           | 0.096          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |  |
| 7.000 | 10.669        | 0.980       | 10.9           | 0.150          | 5.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |  |
| 4.007 | 46.819        | 0.117       | 400.2          | 0.047          | 0.00           | 13.2               | 0.600     | o           | 450         | Pipe/Conduit |  |

Network Results Table

| PN    | Rain<br>(mm/hr) | T.C.<br>(mins) | US/IL<br>(m) | Σ I.Area<br>(ha) | Σ Base<br>Flow (l/s) | Foul<br>(l/s) | Add Flow<br>(l/s) | Vel<br>(m/s) | Cap<br>(l/s) | Flow<br>(l/s) |
|-------|-----------------|----------------|--------------|------------------|----------------------|---------------|-------------------|--------------|--------------|---------------|
| 3.001 | 0.00            | 6.18           | 91.308       | 0.272            | 0.0                  | 0.0           | 0.0               | 1.21         | 85.6         | 0.0           |
| 3.002 | 0.00            | 6.97           | 91.051       | 0.413            | 0.0                  | 0.0           | 0.0               | 1.21         | 85.5         | 0.0           |
| 3.003 | 0.00            | 7.44           | 88.319       | 0.538            | 0.0                  | 0.0           | 0.0               | 1.01         | 161.2        | 0.0           |
| 3.004 | 0.00            | 7.76           | 88.248       | 0.579            | 0.0                  | 0.0           | 0.0               | 1.01         | 161.2        | 0.0           |
| 3.005 | 0.00            | 8.08           | 88.199       | 0.600            | 0.0                  | 0.0           | 0.0               | 1.01         | 160.2        | 0.0           |
| 4.000 | 0.00            | 5.12           | 93.500       | 0.071            | 0.0                  | 0.0           | 0.0               | 2.75         | 109.4        | 0.0           |
| 4.001 | 0.00            | 5.21           | 92.604       | 0.071            | 0.0                  | 0.0           | 0.0               | 2.82         | 112.3        | 0.0           |
| 4.002 | 0.00            | 5.29           | 91.000       | 0.207            | 0.0                  | 0.0           | 0.0               | 2.32         | 368.4        | 0.0           |
| 4.003 | 0.00            | 5.45           | 90.860       | 0.332            | 0.0                  | 0.0           | 0.0               | 2.83         | 450.3        | 0.0           |
| 4.004 | 0.00            | 5.91           | 90.341       | 0.363            | 0.0                  | 0.0           | 0.0               | 1.57         | 249.2        | 0.0           |
| 4.005 | 0.00            | 6.23           | 90.083       | 0.479            | 0.0                  | 0.0           | 0.0               | 2.01         | 319.3        | 0.0           |
| 5.000 | 0.00            | 5.25           | 91.935       | 0.187            | 0.0                  | 0.0           | 0.0               | 2.38         | 94.5         | 0.0           |
| 6.000 | 0.00            | 5.32           | 92.516       | 0.134            | 0.0                  | 0.0           | 0.0               | 2.05         | 81.4         | 0.0           |
| 6.001 | 0.00            | 5.52           | 91.475       | 0.187            | 0.0                  | 0.0           | 0.0               | 1.76         | 124.3        | 0.0           |
| 6.002 | 0.00            | 5.99           | 91.213       | 0.289            | 0.0                  | 0.0           | 0.0               | 1.67         | 118.2        | 0.0           |
| 5.001 | 0.00            | 6.37           | 90.529       | 0.667            | 0.0                  | 0.0           | 0.0               | 2.47         | 393.2        | 0.0           |
| 4.006 | 0.00            | 6.45           | 89.702       | 1.242            | 0.0                  | 0.0           | 0.0               | 2.31         | 366.7        | 0.0           |
| 7.000 | 0.00            | 5.04           | 90.775       | 0.150            | 0.0                  | 0.0           | 0.0               | 3.99         | 158.6        | 0.0           |
| 4.007 | 0.00            | 7.22           | 89.123       | 1.439            | 13.2                 | 0.0           | 0.0               | 1.01         | 160.7        | 13.2          |

|                                                  |                                          |                                                                                     |
|--------------------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------|
| Coopers                                          |                                          | Page 3                                                                              |
| Park House<br>Sandpiper Court<br>Chester CH4 9QU | EDGEHILL PHASE 2<br>CUMBRIA<br>SW Design |  |
| Date 01/05/2019                                  | Designed by Coopers                      |                                                                                     |
| File 7503 3A + Planning.MDX                      | Checked by                               |                                                                                     |
| Micro Drainage                                   | Network 2018.1.1                         |                                                                                     |

Network Design Table for Phase 2+3a new layout 21.3.5.SWS

| PN    | Length<br>(m) | Fall<br>(m) | Slope<br>(1:X) | I.Area<br>(ha) | T.E.<br>(mins) | Base<br>Flow (l/s) | k<br>(mm) | HYD<br>SECT | DIA<br>(mm) | Section Type | Auto<br>Design                                                                        |
|-------|---------------|-------------|----------------|----------------|----------------|--------------------|-----------|-------------|-------------|--------------|---------------------------------------------------------------------------------------|
| 4.008 | 18.860        | 0.047       | 401.3          | 0.069          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |    |
| 8.000 | 9.564         | 0.120       | 79.7           | 0.099          | 5.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |    |
| 8.001 | 37.117        | 0.910       | 40.8           | 0.036          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |    |
| 8.002 | 46.345        | 0.505       | 91.8           | 0.097          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |    |
| 8.003 | 21.675        | 0.531       | 40.8           | 0.140          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |    |
| 4.009 | 25.674        | 0.064       | 401.2          | 0.108          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |    |
| 4.010 | 17.517        | 0.044       | 398.1          | 0.043          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |    |
| 4.011 | 54.799        | 0.137       | 400.0          | 0.236          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |    |
| 4.012 | 24.003        | 0.060       | 400.1          | 0.080          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |    |
| 4.013 | 51.144        | 0.969       | 52.8           | 0.055          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |    |
| 4.014 | 19.107        | 0.391       | 48.9           | 0.179          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |    |
| 4.015 | 19.801        | 0.071       | 278.9          | 0.106          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |    |
| 4.016 | 38.359        | 0.302       | 127.0          | 0.050          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |    |
| 3.006 | 44.143        | 1.379       | 32.0           | 0.088          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |    |
| 1.010 | 61.448        | 1.290       | 47.6           | 0.071          | 0.00           | 0.0                | 0.600     | o           | 675         | Pipe/Conduit |   |
| 9.000 | 21.362        | 0.304       | 70.3           | 0.077          | 5.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |  |
| 9.001 | 25.623        | 0.376       | 68.1           | 0.012          | 0.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |  |
| 9.002 | 24.293        | 0.339       | 71.7           | 0.039          | 0.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |  |
| 9.003 | 46.600        | 0.457       | 102.0          | 0.067          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |  |
| 9.004 | 50.347        | 0.210       | 239.7          | 0.164          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |  |

Network Results Table

| PN    | Rain<br>(mm/hr) | T.C.<br>(mins) | US/IL<br>(m) | Σ I.Area<br>(ha) | Σ Base<br>Flow (l/s) | Foul<br>(l/s) | Add Flow<br>(l/s) | Vel<br>(m/s) | Cap<br>(l/s) | Flow<br>(l/s) |
|-------|-----------------|----------------|--------------|------------------|----------------------|---------------|-------------------|--------------|--------------|---------------|
| 4.008 | 0.00            | 7.53           | 89.006       | 1.508            | 13.2                 | 0.0           | 0.0               | 1.01         | 160.4        | 13.2          |
| 8.000 | 0.00            | 5.11           | 91.475       | 0.099            | 0.0                  | 0.0           | 0.0               | 1.47         | 58.3         | 0.0           |
| 8.001 | 0.00            | 5.36           | 91.280       | 0.135            | 0.0                  | 0.0           | 0.0               | 2.47         | 174.5        | 0.0           |
| 8.002 | 0.00            | 5.83           | 90.370       | 0.232            | 0.0                  | 0.0           | 0.0               | 1.64         | 116.1        | 0.0           |
| 8.003 | 0.00            | 5.98           | 89.865       | 0.372            | 0.0                  | 0.0           | 0.0               | 2.47         | 174.5        | 0.0           |
| 4.009 | 0.00            | 7.96           | 88.959       | 1.988            | 13.2                 | 0.0           | 0.0               | 1.01         | 160.5        | 13.2          |
| 4.010 | 0.00            | 8.24           | 88.895       | 2.031            | 13.2                 | 0.0           | 0.0               | 1.01         | 161.1        | 13.2          |
| 4.011 | 0.00            | 9.15           | 88.851       | 2.267            | 13.2                 | 0.0           | 0.0               | 1.01         | 160.7        | 13.2          |
| 4.012 | 0.00            | 9.54           | 88.714       | 2.347            | 13.2                 | 0.0           | 0.0               | 1.01         | 160.7        | 13.2          |
| 4.013 | 0.00            | 9.85           | 88.654       | 2.402            | 13.2                 | 0.0           | 0.0               | 2.80         | 445.9        | 13.2          |
| 4.014 | 0.00            | 9.96           | 87.685       | 2.581            | 13.2                 | 0.0           | 0.0               | 2.91         | 463.4        | 13.2          |
| 4.015 | 0.00            | 10.23          | 87.294       | 2.687            | 13.2                 | 0.0           | 0.0               | 1.21         | 192.8        | 13.2          |
| 4.016 | 0.00            | 10.58          | 87.223       | 2.737            | 13.2                 | 0.0           | 0.0               | 1.80         | 286.7        | 13.2          |
| 3.006 | 0.00            | 10.79          | 86.921       | 3.425            | 13.2                 | 0.0           | 0.0               | 3.60         | 573.1        | 13.2          |
| 1.010 | 0.00            | 11.06          | 83.519       | 4.384            | 13.2                 | 0.0           | 0.0               | 3.80         | 1361.1       | 13.2          |
| 9.000 | 0.00            | 5.23           | 84.365       | 0.077            | 0.0                  | 0.0           | 0.0               | 1.56         | 62.1         | 0.0           |
| 9.001 | 0.00            | 5.50           | 84.061       | 0.089            | 0.0                  | 0.0           | 0.0               | 1.59         | 63.1         | 0.0           |
| 9.002 | 0.00            | 5.76           | 83.685       | 0.128            | 0.0                  | 0.0           | 0.0               | 1.55         | 61.5         | 0.0           |
| 9.003 | 0.00            | 6.26           | 83.271       | 0.195            | 0.0                  | 0.0           | 0.0               | 1.56         | 110.1        | 0.0           |
| 9.004 | 0.00            | 7.09           | 82.814       | 0.359            | 0.0                  | 0.0           | 0.0               | 1.01         | 71.5         | 0.0           |

|                                                  |                                          |                                                                                     |
|--------------------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------|
| Coopers                                          |                                          | Page 4                                                                              |
| Park House<br>Sandpiper Court<br>Chester CH4 9QU | EDGEHILL PHASE 2<br>CUMBRIA<br>SW Design |  |
| Date 01/05/2019                                  | Designed by Coopers                      |                                                                                     |
| File 7503 3A + Planning.MDX                      | Checked by                               |                                                                                     |
| Micro Drainage                                   | Network 2018.1.1                         |                                                                                     |

Network Design Table for Phase 2+3a new layout 21.3.5.SWS

| PN     | Length<br>(m) | Fall<br>(m) | Slope<br>(1:X) | I.Area<br>(ha) | T.E.<br>(mins) | Base<br>Flow (l/s) | k<br>(mm) | HYD<br>SECT | DIA<br>(mm) | Section Type | Auto<br>Design                                                                        |
|--------|---------------|-------------|----------------|----------------|----------------|--------------------|-----------|-------------|-------------|--------------|---------------------------------------------------------------------------------------|
| 1.011  | 11.781        | 0.029       | 406.2          | 0.148          | 0.00           | 0.0                | 0.600     | o           | 675         | Pipe/Conduit |    |
| 1.012  | 46.517        | 1.034       | 45.0           | 0.008          | 0.00           | 0.0                | 0.600     | o           | 675         | Pipe/Conduit |    |
| 1.013  | 24.120        | 0.360       | 67.0           | 0.010          | 0.00           | 0.0                | 0.600     | o           | 675         | Pipe/Conduit |    |
| 10.000 | 21.739        | 1.431       | 15.2           | 0.047          | 5.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |    |
| 10.001 | 28.254        | 1.414       | 20.0           | 0.070          | 0.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |    |
| 1.014  | 12.639        | 0.248       | 51.0           | 0.093          | 0.00           | 0.0                | 0.600     | o           | 675         | Pipe/Conduit |    |
| 1.015  | 29.584        | 0.373       | 79.3           | 0.056          | 0.00           | 0.0                | 0.600     | o           | 675         | Pipe/Conduit |    |
| 11.000 | 13.070        | 0.077       | 169.7          | 0.083          | 5.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |    |
| 12.000 | 45.344        | 0.648       | 70.0           | 0.209          | 5.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |    |
| 12.001 | 34.363        | 0.636       | 54.0           | 0.087          | 0.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |    |
| 12.002 | 44.603        | 0.265       | 168.3          | 0.074          | 0.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |    |
| 12.003 | 28.940        | 0.193       | 149.9          | 0.073          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |    |
| 12.004 | 21.988        | 0.916       | 24.0           | 0.091          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |    |
| 12.005 | 16.892        | 1.012       | 16.7           | 0.087          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |    |
| 13.000 | 41.136        | 1.286       | 32.0           | 0.111          | 5.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |  |
| 13.001 | 35.630        | 1.101       | 32.4           | 0.078          | 0.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |  |
| 13.002 | 34.499        | 1.232       | 28.0           | 0.090          | 0.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |  |
| 13.003 | 21.353        | 0.142       | 150.4          | 0.054          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |  |
| 13.004 | 16.052        | 0.183       | 87.7           | 0.047          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |  |
| 14.000 | 31.679        | 0.576       | 55.0           | 0.113          | 5.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |  |

Network Results Table

| PN     | Rain<br>(mm/hr) | T.C.<br>(mins) | US/IL<br>(m) | Σ I.Area<br>(ha) | Σ Base<br>Flow (l/s) | Foul<br>(l/s) | Add Flow<br>(l/s) | Vel<br>(m/s) | Cap<br>(l/s) | Flow<br>(l/s) |
|--------|-----------------|----------------|--------------|------------------|----------------------|---------------|-------------------|--------------|--------------|---------------|
| 1.011  | 0.00            | 11.21          | 82.229       | 4.891            | 13.2                 | 0.0           | 0.0               | 1.29         | 463.1        | 13.2          |
| 1.012  | 0.00            | 11.41          | 82.200       | 4.899            | 13.2                 | 0.0           | 0.0               | 3.91         | 1400.7       | 13.2          |
| 1.013  | 0.00            | 11.53          | 81.166       | 4.909            | 13.2                 | 0.0           | 0.0               | 3.21         | 1146.9       | 13.2          |
| 10.000 | 0.00            | 5.11           | 84.125       | 0.047            | 0.0                  | 0.0           | 0.0               | 3.37         | 134.2        | 0.0           |
| 10.001 | 0.00            | 5.27           | 82.670       | 0.117            | 0.0                  | 0.0           | 0.0               | 2.94         | 116.9        | 0.0           |
| 1.014  | 0.00            | 11.59          | 80.806       | 5.119            | 13.2                 | 0.0           | 0.0               | 3.68         | 1315.7       | 13.2          |
| 1.015  | 0.00            | 11.76          | 80.558       | 5.175            | 13.2                 | 0.0           | 0.0               | 2.94         | 1053.8       | 13.2          |
| 11.000 | 0.00            | 5.22           | 83.685       | 0.083            | 0.0                  | 0.0           | 0.0               | 1.00         | 39.8         | 0.0           |
| 12.000 | 0.00            | 5.48           | 93.825       | 0.209            | 0.0                  | 0.0           | 0.0               | 1.57         | 62.2         | 0.0           |
| 12.001 | 0.00            | 5.80           | 93.177       | 0.296            | 0.0                  | 0.0           | 0.0               | 1.78         | 70.9         | 0.0           |
| 12.002 | 0.00            | 6.54           | 90.714       | 0.370            | 0.0                  | 0.0           | 0.0               | 1.00         | 40.0         | 0.0           |
| 12.003 | 0.00            | 6.92           | 90.374       | 0.443            | 0.0                  | 0.0           | 0.0               | 1.28         | 90.6         | 0.0           |
| 12.004 | 0.00            | 7.03           | 90.181       | 0.534            | 0.0                  | 0.0           | 0.0               | 3.22         | 227.8        | 0.0           |
| 12.005 | 0.00            | 7.11           | 89.265       | 0.621            | 0.0                  | 0.0           | 0.0               | 3.87         | 273.3        | 0.0           |
| 13.000 | 0.00            | 5.30           | 96.586       | 0.111            | 0.0                  | 0.0           | 0.0               | 2.32         | 92.3         | 0.0           |
| 13.001 | 0.00            | 5.55           | 95.300       | 0.189            | 0.0                  | 0.0           | 0.0               | 2.31         | 91.8         | 0.0           |
| 13.002 | 0.00            | 5.78           | 94.199       | 0.279            | 0.0                  | 0.0           | 0.0               | 2.48         | 98.7         | 0.0           |
| 13.003 | 0.00            | 6.06           | 92.892       | 0.333            | 0.0                  | 0.0           | 0.0               | 1.28         | 90.5         | 0.0           |
| 13.004 | 0.00            | 6.22           | 92.750       | 0.380            | 0.0                  | 0.0           | 0.0               | 1.68         | 118.7        | 0.0           |
| 14.000 | 0.00            | 5.30           | 93.611       | 0.113            | 0.0                  | 0.0           | 0.0               | 1.77         | 70.3         | 0.0           |

|                                                  |                                          |                                                                                     |
|--------------------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------|
| Coopers                                          |                                          | Page 5                                                                              |
| Park House<br>Sandpiper Court<br>Chester CH4 9QU | EDGEHILL PHASE 2<br>CUMBRIA<br>SW Design |  |
| Date 01/05/2019                                  | Designed by Coopers                      |                                                                                     |
| File 7503 3A + Planning.MDX                      | Checked by                               |                                                                                     |
| Micro Drainage                                   | Network 2018.1.1                         |                                                                                     |

Network Design Table for Phase 2+3a new layout 21.3.5.SWS

| PN     | Length<br>(m) | Fall<br>(m) | Slope<br>(1:X) | I.Area<br>(ha) | T.E.<br>(mins) | Base<br>Flow (l/s) | k<br>(mm) | HYD<br>SECT | DIA<br>(mm) | Section Type | Auto<br>Design                                                                        |
|--------|---------------|-------------|----------------|----------------|----------------|--------------------|-----------|-------------|-------------|--------------|---------------------------------------------------------------------------------------|
| 14.001 | 15.813        | 0.105       | 150.6          | 0.044          | 0.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |    |
| 14.002 | 17.647        | 0.287       | 61.5           | 0.059          | 0.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |    |
| 13.005 | 21.223        | 0.786       | 27.0           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |    |
| 13.006 | 40.929        | 0.835       | 49.0           | 0.108          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |    |
| 13.007 | 22.496        | 0.369       | 61.0           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |    |
| 13.008 | 32.650        | 1.256       | 26.0           | 0.063          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |    |
| 13.009 | 25.532        | 0.248       | 103.0          | 0.100          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |    |
| 12.006 | 20.720        | 0.052       | 398.5          | 0.037          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |    |
| 12.007 | 34.790        | 0.089       | 390.9          | 0.141          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |    |
| 12.008 | 35.143        | 0.086       | 408.6          | 0.167          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |    |
| 15.000 | 63.225        | 1.664       | 38.0           | 0.185          | 5.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |    |
| 15.001 | 28.234        | 0.523       | 54.0           | 0.081          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |    |
| 15.002 | 21.480        | 0.716       | 30.0           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |    |
| 15.003 | 10.725        | 0.358       | 30.0           | 0.098          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |    |
| 15.004 | 16.244        | 0.041       | 396.2          | 0.000          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |    |
| 15.005 | 13.983        | 0.035       | 399.5          | 0.011          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |   |
| 12.009 | 26.369        | 0.129       | 204.4          | 0.086          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |  |
| 11.001 | 27.953        | 0.904       | 30.9           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |  |
| 11.002 | 27.953        | 1.075       | 26.0           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |  |
| 1.016  | 46.235        | 0.589       | 78.5           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 750         | Pipe/Conduit |  |

Network Results Table

| PN     | Rain<br>(mm/hr) | T.C.<br>(mins) | US/IL<br>(m) | Σ I.Area<br>(ha) | Σ Base<br>Flow (l/s) | Foul<br>(l/s) | Add Flow<br>(l/s) | Vel<br>(m/s) | Cap<br>(l/s) | Flow<br>(l/s) |
|--------|-----------------|----------------|--------------|------------------|----------------------|---------------|-------------------|--------------|--------------|---------------|
| 14.001 | 0.00            | 5.55           | 93.035       | 0.157            | 0.0                  | 0.0           | 0.0               | 1.06         | 42.3         | 0.0           |
| 14.002 | 0.00            | 5.72           | 92.930       | 0.216            | 0.0                  | 0.0           | 0.0               | 1.67         | 66.4         | 0.0           |
| 13.005 | 0.00            | 6.34           | 92.567       | 0.596            | 0.0                  | 0.0           | 0.0               | 3.04         | 214.7        | 0.0           |
| 13.006 | 0.00            | 6.57           | 91.631       | 0.704            | 0.0                  | 0.0           | 0.0               | 2.91         | 462.7        | 0.0           |
| 13.007 | 0.00            | 6.72           | 90.796       | 0.704            | 0.0                  | 0.0           | 0.0               | 2.61         | 414.7        | 0.0           |
| 13.008 | 0.00            | 6.85           | 90.427       | 0.767            | 0.0                  | 0.0           | 0.0               | 4.00         | 636.2        | 0.0           |
| 13.009 | 0.00            | 7.06           | 88.350       | 0.867            | 0.0                  | 0.0           | 0.0               | 2.00         | 318.7        | 0.0           |
| 12.006 | 0.00            | 7.45           | 86.700       | 1.525            | 0.0                  | 0.0           | 0.0               | 1.01         | 161.0        | 0.0           |
| 12.007 | 0.00            | 8.01           | 84.861       | 1.666            | 0.0                  | 0.0           | 0.0               | 1.02         | 162.6        | 0.0           |
| 12.008 | 0.00            | 8.60           | 83.599       | 1.833            | 0.0                  | 0.0           | 0.0               | 1.00         | 159.0        | 0.0           |
| 15.000 | 0.00            | 5.49           | 89.136       | 0.185            | 0.0                  | 0.0           | 0.0               | 2.13         | 84.6         | 0.0           |
| 15.001 | 0.00            | 5.71           | 87.397       | 0.266            | 0.0                  | 0.0           | 0.0               | 2.14         | 151.6        | 0.0           |
| 15.002 | 0.00            | 5.84           | 85.741       | 0.266            | 0.0                  | 0.0           | 0.0               | 2.88         | 203.7        | 0.0           |
| 15.003 | 0.00            | 5.90           | 85.025       | 0.364            | 0.0                  | 0.0           | 0.0               | 2.88         | 203.8        | 0.0           |
| 15.004 | 0.00            | 6.17           | 84.517       | 0.364            | 0.0                  | 0.0           | 0.0               | 1.02         | 161.5        | 0.0           |
| 15.005 | 0.00            | 6.40           | 84.476       | 0.375            | 0.0                  | 0.0           | 0.0               | 1.01         | 160.8        | 0.0           |
| 12.009 | 0.00            | 8.91           | 83.513       | 2.294            | 0.0                  | 0.0           | 0.0               | 1.42         | 225.6        | 0.0           |
| 11.001 | 0.00            | 9.04           | 83.384       | 2.377            | 0.0                  | 0.0           | 0.0               | 3.67         | 583.1        | 0.0           |
| 11.002 | 0.00            | 9.15           | 81.485       | 2.377            | 0.0                  | 0.0           | 0.0               | 4.00         | 636.1        | 0.0           |
| 1.016  | 0.00            | 12.00          | 77.935       | 7.552            | 13.2                 | 0.0           | 0.0               | 3.16         | 1396.3       | 13.2          |

|                             |                     |                                                                                     |
|-----------------------------|---------------------|-------------------------------------------------------------------------------------|
| Coopers                     |                     | Page 6                                                                              |
| Park House                  | EDGEHILL PHASE 2    |  |
| Sandpiper Court             | CUMBRIA             |                                                                                     |
| Chester CH4 9QU             | SW Design           |                                                                                     |
| Date 01/05/2019             | Designed by Coopers |                                                                                     |
| File 7503 3A + Planning.MDX | Checked by          |                                                                                     |
| Micro Drainage              | Network 2018.1.1    |                                                                                     |

Network Design Table for Phase 2+3a new layout 21.3.5.SWS

| PN     | Length<br>(m) | Fall<br>(m) | Slope<br>(1:X) | I.Area<br>(ha) | T.E.<br>(mins) | Base<br>Flow (l/s) | k<br>(mm) | HYD<br>SECT | DIA<br>(mm) | Section Type | Auto<br>Design                                                                       |
|--------|---------------|-------------|----------------|----------------|----------------|--------------------|-----------|-------------|-------------|--------------|--------------------------------------------------------------------------------------|
| 1.017  | 34.247        | 0.410       | 83.5           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 750         | Pipe/Conduit |   |
| 16.000 | 21.861        | 0.129       | 169.5          | 0.035          | 5.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |   |
| 16.001 | 18.916        | 1.651       | 11.5           | 0.049          | 0.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |   |
| 16.002 | 14.610        | 1.328       | 11.0           | 0.129          | 0.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |   |
| 1.018  | 20.718        | 0.430       | 48.2           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 750         | Pipe/Conduit |   |
| 17.000 | 19.124        | 0.112       | 170.8          | 0.058          | 5.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |   |
| 17.001 | 35.278        | 0.208       | 169.6          | 0.052          | 0.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |   |
| 17.002 | 23.191        | 0.315       | 73.6           | 0.044          | 0.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |   |
| 1.019  | 13.163        | 0.200       | 65.8           | 0.049          | 0.00           | 0.0                | 0.600     | o           | 750         | Pipe/Conduit |   |
| 1.020  | 29.678        | 0.694       | 42.8           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 750         | Pipe/Conduit |   |
| 1.021  | 71.017        | 1.420       | 50.0           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 750         | Pipe/Conduit |   |
| 1.022  | 24.246#       | 0.485       | 50.0           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 750         | Pipe/Conduit |   |
| 1.023  | 46.344        | 1.930       | 24.0           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |   |
| 1.024  | 16.932        | 0.170       | 99.6           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |  |

Network Results Table

| PN     | Rain<br>(mm/hr) | T.C.<br>(mins) | US/IL<br>(m) | Σ I.Area<br>(ha) | Σ Base<br>Flow (l/s) | Foul<br>(l/s) | Add Flow<br>(l/s) | Vel<br>(m/s) | Cap<br>(l/s) | Flow<br>(l/s) |
|--------|-----------------|----------------|--------------|------------------|----------------------|---------------|-------------------|--------------|--------------|---------------|
| 1.017  | 0.00            | 12.19          | 75.851       | 7.552            | 13.2                 | 0.0           | 0.0               | 3.06         | 1353.4       | 13.2          |
| 16.000 | 0.00            | 5.36           | 78.325       | 0.035            | 0.0                  | 0.0           | 0.0               | 1.00         | 39.8         | 0.0           |
| 16.001 | 0.00            | 5.44           | 78.196       | 0.084            | 0.0                  | 0.0           | 0.0               | 3.89         | 154.6        | 0.0           |
| 16.002 | 0.00            | 5.51           | 76.545       | 0.213            | 0.0                  | 0.0           | 0.0               | 3.97         | 157.8        | 0.0           |
| 1.018  | 0.00            | 12.27          | 73.191       | 7.765            | 13.2                 | 0.0           | 0.0               | 4.04         | 1783.8       | 13.2          |
| 17.000 | 0.00            | 5.32           | 72.725       | 0.058            | 0.0                  | 0.0           | 0.0               | 1.00         | 39.7         | 0.0           |
| 17.001 | 0.00            | 5.91           | 72.613       | 0.110            | 0.0                  | 0.0           | 0.0               | 1.00         | 39.8         | 0.0           |
| 17.002 | 0.00            | 6.16           | 72.405       | 0.154            | 0.0                  | 0.0           | 0.0               | 1.53         | 60.7         | 0.0           |
| 1.019  | 0.00            | 12.34          | 70.762       | 7.968            | 13.2                 | 0.0           | 0.0               | 3.45         | 1525.4       | 13.2          |
| 1.020  | 0.00            | 12.45          | 68.562       | 7.968            | 13.2                 | 0.0           | 0.0               | 4.29         | 1893.8       | 13.2          |
| 1.021  | 0.00            | 12.75          | 65.605       | 7.968            | 13.2                 | 0.0           | 0.0               | 3.96         | 1750.7       | 13.2          |
| 1.022  | 0.00            | 12.85          | 64.185       | 7.968            | 13.2                 | 0.0           | 0.0               | 3.96         | 1751.1       | 13.2          |
| 1.023  | 0.00            | 13.04          | 62.988       | 7.968            | 13.2                 | 0.0           | 0.0               | 4.16         | 662.0        | 13.2          |
| 1.024  | 0.00            | 13.18          | 59.470       | 7.968            | 13.2                 | 0.0           | 0.0               | 2.04         | 324.0        | 13.2          |

|                                                  |                                          |                                                                                     |
|--------------------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------|
| Coopers                                          |                                          | Page 7                                                                              |
| Park House<br>Sandpiper Court<br>Chester CH4 9QU | EDGEHILL PHASE 2<br>CUMBRIA<br>SW Design |  |
| Date 01/05/2019                                  | Designed by Coopers                      |                                                                                     |
| File 7503 3A + Planning.MDX                      | Checked by                               |                                                                                     |
| Micro Drainage                                   | Network 2018.1.1                         |                                                                                     |

Manhole Schedules for Phase 2+3a new layout 21.3.5.SWS

| MH Name | MH CL (m) | MH Depth (m) | MH Connection | MH Diam., L*W (mm) | Pipe Out PN | Pipe Out Invert Level (m) | Pipe Out Diameter (mm) | Pipes In PN | Pipes In Invert Level (m) | Pipes In Diameter (mm) | Backdrop (mm) |
|---------|-----------|--------------|---------------|--------------------|-------------|---------------------------|------------------------|-------------|---------------------------|------------------------|---------------|
| 301     | 92.720    | 1.800        | Open Manhole  | 1200               | 1.000       | 90.920                    | 225                    |             |                           |                        |               |
| 302     | 92.934    | 2.172        | Open Manhole  | 1200               | 1.001       | 90.762                    | 225                    | 1.000       | 90.762                    | 225                    |               |
| 303     | 92.346    | 1.899        | Open Manhole  | 1500               | 1.002       | 90.447                    | 225                    | 1.001       | 90.447                    | 225                    |               |
| 304     | 92.220    | 2.020        | Open Manhole  | 1500               | 1.003       | 90.200                    | 300                    | 1.002       | 90.275                    | 225                    |               |
| 305     | 91.529    | 1.994        | Open Manhole  | 1500               | 1.004       | 89.535                    | 300                    | 1.003       | 89.535                    | 300                    |               |
| 306     | 91.072    | 1.875        | Open Manhole  | 1500               | 1.005       | 89.197                    | 300                    | 1.004       | 89.197                    | 300                    |               |
| 307     | 90.507    | 1.875        | Open Manhole  | 1500               | 1.006       | 88.632                    | 300                    | 1.005       | 88.632                    | 300                    |               |
| 308     | 90.417    | 1.920        | Open Manhole  | 2000               | 1.007       | 88.497                    | 300                    | 1.006       | 88.497                    | 300                    |               |
| 1       | 89.350    | 1.976        | Open Manhole  | 1500               | 1.008       | 87.376                    | 300                    | 1.007       | 87.374                    | 300                    |               |
| 2       | 89.317    | 2.075        | Open Manhole  | 1200               | 2.000       | 87.242                    | 225                    |             |                           |                        |               |
| 3       | 89.000    | 2.274        | Open Manhole  | 1500               | 1.009       | 86.726                    | 300                    | 1.008       | 86.726                    | 300                    |               |
|         |           |              |               |                    |             |                           |                        | 2.000       | 86.925                    | 225                    | 124           |
| 228     | 94.053    | 1.725        | Open Manhole  | 1800               | 3.000       | 92.328                    | 225                    |             |                           |                        |               |
| 229     | 93.109    | 1.801        | Open Manhole  | 1800               | 3.001       | 91.308                    | 300                    | 3.000       | 91.383                    | 225                    |               |
| 230     | 93.104    | 2.053        | Open Manhole  | 1800               | 3.002       | 91.051                    | 300                    | 3.001       | 91.051                    | 300                    |               |
| 231     | 92.627    | 4.308        | Open Manhole  | 1800               | 3.003       | 88.319                    | 450                    | 3.002       | 90.707                    | 300                    | 2238          |
| 232     | 92.410    | 4.162        | Open Manhole  | 1800               | 3.004       | 88.248                    | 450                    | 3.003       | 88.248                    | 450                    |               |
| 233     | 91.272    | 3.073        | Open Manhole  | 1800               | 3.005       | 88.199                    | 450                    | 3.004       | 88.199                    | 450                    |               |
| 201     | 95.631    | 2.131        | Open Manhole  | 1800               | 4.000       | 93.500                    | 225                    |             |                           |                        |               |
| 202     | 94.330    | 1.726        | Open Manhole  | 1800               | 4.001       | 92.604                    | 225                    | 4.000       | 92.604                    | 225                    |               |
| 203     | 93.557    | 2.557        | Open Manhole  | 1800               | 4.002       | 91.000                    | 450                    | 4.001       | 91.902                    | 225                    | 677           |
| 204     | 93.311    | 2.451        | Open Manhole  | 1800               | 4.003       | 90.860                    | 450                    | 4.002       | 90.860                    | 450                    |               |
| 205     | 92.291    | 1.950        | Open Manhole  | 1800               | 4.004       | 90.341                    | 450                    | 4.003       | 90.341                    | 450                    |               |
| 206     | 92.246    | 2.163        | Open Manhole  | 1800               | 4.005       | 90.083                    | 450                    | 4.004       | 90.083                    | 450                    |               |
| 207     | 93.660    | 1.725        | Open Manhole  | 1800               | 5.000       | 91.935                    | 225                    |             |                           |                        |               |
| 208     | 94.241    | 1.725        | Open Manhole  | 1800               | 6.000       | 92.516                    | 225                    |             |                           |                        |               |
| 209     | 93.200    | 1.725        | Open Manhole  | 1800               | 6.001       | 91.475                    | 300                    | 6.000       | 91.551                    | 225                    | 1             |
| 210     | 92.938    | 1.725        | Open Manhole  | 1800               | 6.002       | 91.213                    | 300                    | 6.001       | 91.213                    | 300                    |               |
| 211     | 92.445    | 1.916        | Open Manhole  | 1800               | 5.001       | 90.529                    | 450                    | 5.000       | 90.754                    | 225                    |               |
|         |           |              |               |                    |             |                           |                        | 6.002       | 90.679                    | 300                    |               |
| 212     | 91.780    | 2.078        | Open Manhole  | 2100               | 4.006       | 89.702                    | 450                    | 4.005       | 89.702                    | 450                    |               |
|         |           |              |               |                    |             |                           |                        | 5.001       | 89.702                    | 450                    |               |
| 213     | 92.500    | 1.725        | Open Manhole  | 1800               | 7.000       | 90.775                    | 225                    |             |                           |                        |               |
| 214     | 92.153    | 3.030        | Open Manhole  | 2100               | 4.007       | 89.123                    | 450                    | 4.006       | 89.565                    | 450                    | 442           |
|         |           |              |               |                    |             |                           |                        | 7.000       | 89.795                    | 225                    | 447           |
| 215     | 92.535    | 3.529        | Open Manhole  | 2100               | 4.008       | 89.006                    | 450                    | 4.007       | 89.006                    | 450                    |               |
| 216     | 93.200    | 1.725        | Open Manhole  | 1800               | 8.000       | 91.475                    | 225                    |             |                           |                        |               |
| 217     | 93.400    | 2.120        | Open Manhole  | 1800               | 8.001       | 91.280                    | 300                    | 8.000       | 91.355                    | 225                    |               |
| 218     | 92.170    | 1.800        | Open Manhole  | 1800               | 8.002       | 90.370                    | 300                    | 8.001       | 90.370                    | 300                    |               |
| 219     | 91.665    | 1.800        | Open Manhole  | 1800               | 8.003       | 89.865                    | 300                    | 8.002       | 89.865                    | 300                    |               |
| 220     | 92.369    | 3.410        | Open Manhole  | 2100               | 4.009       | 88.959                    | 450                    | 4.008       | 88.959                    | 450                    |               |
|         |           |              |               |                    |             |                           |                        | 8.003       | 89.334                    | 300                    | 225           |
| 221     | 92.288    | 3.393        | Open Manhole  | 2100               | 4.010       | 88.895                    | 450                    | 4.009       | 88.895                    | 450                    |               |
| 222     | 92.554    | 3.703        | Open Manhole  | 2100               | 4.011       | 88.851                    | 450                    | 4.010       | 88.851                    | 450                    |               |

|                                                  |                                          |                                                                                     |
|--------------------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------|
| Coopers                                          |                                          | Page 8                                                                              |
| Park House<br>Sandpiper Court<br>Chester CH4 9QU | EDGEHILL PHASE 2<br>CUMBRIA<br>SW Design |  |
| Date 01/05/2019                                  | Designed by Coopers                      |                                                                                     |
| File 7503 3A + Planning.MDX                      | Checked by                               |                                                                                     |
| Micro Drainage                                   | Network 2018.1.1                         |                                                                                     |

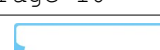
Manhole Schedules for Phase 2+3a new layout 21.3.5.SWS

| MH Name | MH CL (m) | MH Depth (m) | MH Connection | MH Diam., L*W (mm) | PN     | Pipe Out Invert Level (m) | Diameter (mm) | PN     | Pipes In Invert Level (m) | Diameter (mm) | Backdrop (mm) |
|---------|-----------|--------------|---------------|--------------------|--------|---------------------------|---------------|--------|---------------------------|---------------|---------------|
| 223     | 92.707    | 3.993        | Open Manhole  | 2100               | 4.012  | 88.714                    | 450           | 4.011  | 88.714                    | 450           |               |
| 224     | 92.063    | 3.409        | Open Manhole  | 2100               | 4.013  | 88.654                    | 450           | 4.012  | 88.654                    | 450           |               |
| 225     | 90.600    | 2.915        | Open Manhole  | 2100               | 4.014  | 87.685                    | 450           | 4.013  | 87.685                    | 450           |               |
| 226     | 90.123    | 2.829        | Open Manhole  | 1800               | 4.015  | 87.294                    | 450           | 4.014  | 87.294                    | 450           |               |
| 227     | 89.642    | 2.419        | Open Manhole  | 1800               | 4.016  | 87.223                    | 450           | 4.015  | 87.223                    | 450           |               |
| 234     | 89.871    | 2.950        | Open Manhole  | 2100               | 3.006  | 86.921                    | 450           | 3.005  | 88.151                    | 450           | 1230          |
|         |           |              |               |                    |        |                           |               | 4.016  | 86.921                    | 450           |               |
| 5       | 87.612    | 4.093        | Open Manhole  | 2400               | 1.010  | 83.519                    | 675           | 1.009  | 85.991                    | 300           | 2097          |
|         |           |              |               |                    |        |                           |               | 3.006  | 85.542                    | 450           | 1798          |
| 6       | 86.140    | 1.775        | Open Manhole  | 1500               | 9.000  | 84.365                    | 225           |        |                           |               |               |
| 7       | 85.836    | 1.775        | Open Manhole  | 1200               | 9.001  | 84.061                    | 225           | 9.000  | 84.061                    | 225           |               |
| 8       | 85.460    | 1.775        | Open Manhole  | 1200               | 9.002  | 83.685                    | 225           | 9.001  | 83.685                    | 225           |               |
| 9       | 85.121    | 1.850        | Open Manhole  | 1500               | 9.003  | 83.271                    | 300           | 9.002  | 83.346                    | 225           |               |
| 10      | 84.553    | 1.739        | Open Manhole  | 1350               | 9.004  | 82.814                    | 300           | 9.003  | 82.814                    | 300           |               |
| 11      | 84.815    | 2.586        | Open Manhole  | 1800               | 1.011  | 82.229                    | 675           | 1.010  | 82.229                    | 675           |               |
|         |           |              |               |                    |        |                           |               | 9.004  | 82.604                    | 300           |               |
| 12      | 84.270    | 2.070        | Open Manhole  | 1800               | 1.012  | 82.200                    | 675           | 1.011  | 82.200                    | 675           |               |
| 13      | 83.408    | 2.242        | Open Manhole  | 1800               | 1.013  | 81.166                    | 675           | 1.012  | 81.166                    | 675           |               |
| 14A     | 85.850    | 1.725        | Open Manhole  | 1200               | 10.000 | 84.125                    | 225           |        |                           |               |               |
| 14      | 84.400    | 1.730        | Open Manhole  | 1200               | 10.001 | 82.670                    | 225           | 10.000 | 82.694                    | 225           | 24            |
| 15      | 82.945    | 2.139        | Open Manhole  | 1800               | 1.014  | 80.806                    | 675           | 1.013  | 80.806                    | 675           |               |
|         |           |              |               |                    |        |                           |               | 10.001 | 81.256                    | 225           |               |
| 16      | 82.900    | 2.342        | Open Manhole  | 1800               | 1.015  | 80.558                    | 675           | 1.014  | 80.558                    | 675           |               |
| 17      | 85.450    | 1.765        | Open Manhole  | 1500               | 11.000 | 83.685                    | 225           |        |                           |               |               |
| 101     | 95.421    | 1.596        | Open Manhole  | 1500               | 12.000 | 93.825                    | 225           |        |                           |               |               |
| 102     | 95.658    | 2.481        | Open Manhole  | 1500               | 12.001 | 93.177                    | 225           | 12.000 | 93.177                    | 225           |               |
| 103     | 93.939    | 3.225        | Open Manhole  | 1500               | 12.002 | 90.714                    | 225           | 12.001 | 92.541                    | 225           | 1827          |
| 104     | 92.227    | 1.853        | Open Manhole  | 1500               | 12.003 | 90.374                    | 300           | 12.002 | 90.449                    | 225           |               |
| 105     | 91.823    | 1.642        | Open Manhole  | 1500               | 12.004 | 90.181                    | 300           | 12.003 | 90.181                    | 300           |               |
| 106     | 90.962    | 1.697        | Open Manhole  | 1500               | 12.005 | 89.265                    | 300           | 12.004 | 89.265                    | 300           |               |
| 107     | 98.004    | 1.418        | Open Manhole  | 1500               | 13.000 | 96.586                    | 225           |        |                           |               |               |
| 108     | 96.719    | 1.419        | Open Manhole  | 1500               | 13.001 | 95.300                    | 225           | 13.000 | 95.300                    | 225           |               |
| 109     | 95.611    | 1.412        | Open Manhole  | 1500               | 13.002 | 94.199                    | 225           | 13.001 | 94.199                    | 225           |               |
| 110     | 94.713    | 1.821        | Open Manhole  | 1500               | 13.003 | 92.892                    | 300           | 13.002 | 92.967                    | 225           |               |
| 111     | 94.804    | 2.054        | Open Manhole  | 1500               | 13.004 | 92.750                    | 300           | 13.003 | 92.750                    | 300           |               |
| 112     | 95.343    | 1.732        | Open Manhole  | 1500               | 14.000 | 93.611                    | 225           |        |                           |               |               |
| 113     | 94.764    | 1.729        | Open Manhole  | 1500               | 14.001 | 93.035                    | 225           | 14.000 | 93.035                    | 225           |               |
| 114     | 94.477    | 1.547        | Open Manhole  | 1500               | 14.002 | 92.930                    | 225           | 14.001 | 92.930                    | 225           |               |
| 115     | 94.328    | 1.761        | Open Manhole  | 1500               | 13.005 | 92.567                    | 300           | 13.004 | 92.567                    | 300           |               |
|         |           |              |               |                    |        |                           |               | 14.002 | 92.643                    | 225           | 1             |
| 116     | 93.508    | 1.877        | Open Manhole  | 1800               | 13.006 | 91.631                    | 450           | 13.005 | 91.781                    | 300           |               |
| 117     | 92.705    | 1.909        | Open Manhole  | 1800               | 13.007 | 90.796                    | 450           | 13.006 | 90.796                    | 450           |               |
| 118     | 92.253    | 1.826        | Open Manhole  | 1800               | 13.008 | 90.427                    | 450           | 13.007 | 90.427                    | 450           |               |
| 119     | 90.905    | 2.555        | Open Manhole  | 1800               | 13.009 | 88.350                    | 450           | 13.008 | 89.171                    | 450           | 821           |

|                                                  |                                          |                                                                                     |
|--------------------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------|
| Coopers                                          |                                          | Page 9                                                                              |
| Park House<br>Sandpiper Court<br>Chester CH4 9QU | EDGEHILL PHASE 2<br>CUMBRIA<br>SW Design |  |
| Date 01/05/2019                                  | Designed by Coopers                      |                                                                                     |
| File 7503 3A + Planning.MDX                      | Checked by                               |                                                                                     |
| Micro Drainage                                   | Network 2018.1.1                         |                                                                                     |

Manhole Schedules for Phase 2+3a new layout 21.3.5.SWS

| MH Name | MH CL (m) | MH Depth (m) | MH Connection | MH Diam., L*W (mm) | PN     | Pipe Out Invert Level (m) | Diameter (mm) | PN     | Pipes In Invert Level (m) | Diameter (mm) | Backdrop (mm) |
|---------|-----------|--------------|---------------|--------------------|--------|---------------------------|---------------|--------|---------------------------|---------------|---------------|
| 120     | 89.831    | 3.131        | Open Manhole  | 1800               | 12.006 | 86.700                    | 450           | 12.005 | 88.253                    | 300           | 1403          |
|         |           |              |               |                    |        |                           |               | 13.009 | 88.102                    | 450           | 1402          |
| 121     | 88.455    | 3.594        | Open Manhole  | 1800               | 12.007 | 84.861                    | 450           | 12.006 | 86.648                    | 450           | 1787          |
| 122     | 86.687    | 3.088        | Open Manhole  | 1800               | 12.008 | 83.599                    | 450           | 12.007 | 84.772                    | 450           | 1173          |
| 123     | 91.600    | 2.464        | Open Manhole  | 1500               | 15.000 | 89.136                    | 225           |        |                           |               |               |
| 124     | 89.200    | 1.803        | Open Manhole  | 1500               | 15.001 | 87.397                    | 300           | 15.000 | 87.472                    | 225           |               |
| 125     | 88.600    | 2.859        | Open Manhole  | 1500               | 15.002 | 85.741                    | 300           | 15.001 | 86.874                    | 300           | 1133          |
| 126     | 87.780    | 2.755        | Open Manhole  | 1500               | 15.003 | 85.025                    | 300           | 15.002 | 85.025                    | 300           |               |
| 127     | 87.271    | 2.754        | Open Manhole  | 2100               | 15.004 | 84.517                    | 450           | 15.003 | 84.667                    | 300           |               |
| 128     | 86.530    | 2.054        | Open Manhole  | 2100               | 15.005 | 84.476                    | 450           | 15.004 | 84.476                    | 450           |               |
| 129     | 86.222    | 2.709        | Open Manhole  | 2100               | 12.009 | 83.513                    | 450           | 12.008 | 83.513                    | 450           |               |
|         |           |              |               |                    |        |                           |               | 15.005 | 84.441                    | 450           | 928           |
| 18      | 85.034    | 1.650        | Open Manhole  | 1500               | 11.001 | 83.384                    | 450           | 11.000 | 83.608                    | 225           |               |
|         |           |              |               |                    |        |                           |               | 12.009 | 83.384                    | 450           |               |
| 19      | 84.500    | 3.015        | Open Manhole  | 1800               | 11.002 | 81.485                    | 450           | 11.001 | 82.480                    | 450           | 995           |
| 20      | 83.055    | 5.120        | Open Manhole  | 2400               | 1.016  | 77.935                    | 750           | 1.015  | 80.185                    | 675           | 2175          |
|         |           |              |               |                    |        |                           |               | 11.002 | 80.410                    | 450           | 2175          |
| 21      | 79.521    | 3.670        | Open Manhole  | 2400               | 1.017  | 75.851                    | 750           | 1.016  | 77.346                    | 750           | 1495          |
| 22A     | 80.050    | 1.725        | Open Manhole  | 1200               | 16.000 | 78.325                    | 225           |        |                           |               |               |
| 22B     | 79.925    | 1.729        | Open Manhole  | 1200               | 16.001 | 78.196                    | 225           | 16.000 | 78.196                    | 225           |               |
| 22      | 79.360    | 2.815        | Open Manhole  | 1500               | 16.002 | 76.545                    | 225           | 16.001 | 76.545                    | 225           |               |
| 23      | 77.691    | 4.500        | Open Manhole  | 2400               | 1.018  | 73.191                    | 750           | 1.017  | 75.441                    | 750           | 2250          |
|         |           |              |               |                    |        |                           |               | 16.002 | 75.217                    | 225           | 1501          |
| 24A     | 74.450    | 1.725        | Open Manhole  | 1200               | 17.000 | 72.725                    | 225           |        |                           |               |               |
| 24B     | 74.850    | 2.237        | Open Manhole  | 1200               | 17.001 | 72.613                    | 225           | 17.000 | 72.613                    | 225           |               |
| 24C     | 76.500    | 4.095        | Open Manhole  | 1200               | 17.002 | 72.405                    | 225           | 17.001 | 72.405                    | 225           |               |
| 24      | 76.000    | 5.238        | Open Manhole  | 2400               | 1.019  | 70.762                    | 750           | 1.018  | 72.761                    | 750           | 1999          |
|         |           |              |               |                    |        |                           |               | 17.002 | 72.090                    | 225           | 803           |
| 25      | 73.500    | 4.938        | Open Manhole  | 2400               | 1.020  | 68.562                    | 750           | 1.019  | 70.562                    | 750           | 2000          |
| 26      | 70.610    | 5.005        | Open Manhole  | 2400               | 1.021  | 65.605                    | 750           | 1.020  | 67.868                    | 750           | 2263          |
| 27      | 66.500    | 2.315        | Open Manhole  | 2400               | 1.022  | 64.185                    | 750           | 1.021  | 64.185                    | 750           |               |
| 28      | 64.600    | 1.612        | Open Manhole  | 1800               | 1.023  | 62.988                    | 450           | 1.022  | 63.700                    | 750           | 1012          |
| 29      | 62.750    | 3.280        | Open Manhole  | 1500               | 1.024  | 59.470                    | 450           | 1.023  | 61.058                    | 450           | 1588          |
| 30      | 60.250    | 0.950        | Open Manhole  | 0                  |        | OUTFALL                   |               | 1.024  | 59.300                    | 450           |               |

|                                                  |                                          |                                                                                    |
|--------------------------------------------------|------------------------------------------|------------------------------------------------------------------------------------|
| Coopers                                          |                                          | Page 10                                                                            |
| Park House<br>Sandpiper Court<br>Chester CH4 9QU | EDGEHILL PHASE 2<br>CUMBRIA<br>SW Design |  |
| Date 01/05/2019                                  | Designed by Coopers                      |                                                                                    |
| File 7503 3A + Planning.MDX                      | Checked by                               |                                                                                    |
| Micro Drainage                                   | Network 2018.1.1                         |                                                                                    |

PIPELINE SCHEDULES for Phase 2+3a new layout 21.3.5.SWS

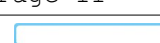
Upstream Manhole

# - Indicates pipe length does not match coordinates

| PN    | Hyd<br>Sect | Diam<br>(mm) | MH<br>Name | C.Level<br>(m) | I.Level<br>(m) | D.Depth<br>(m) | MH<br>Connection | MH DIAM., L*W<br>(mm) |
|-------|-------------|--------------|------------|----------------|----------------|----------------|------------------|-----------------------|
| 1.000 | o           | 225          | 301        | 92.720         | 90.920         | 1.575          | Open Manhole     | 1200                  |
| 1.001 | o           | 225          | 302        | 92.934         | 90.762         | 1.947          | Open Manhole     | 1200                  |
| 1.002 | o           | 225          | 303        | 92.346         | 90.447         | 1.674          | Open Manhole     | 1500                  |
| 1.003 | o           | 300          | 304        | 92.220         | 90.200         | 1.720          | Open Manhole     | 1500                  |
| 1.004 | o           | 300          | 305        | 91.529         | 89.535         | 1.694          | Open Manhole     | 1500                  |
| 1.005 | o           | 300          | 306        | 91.072         | 89.197         | 1.575          | Open Manhole     | 1500                  |
| 1.006 | o           | 300          | 307        | 90.507         | 88.632         | 1.575          | Open Manhole     | 1500                  |
| 1.007 | o           | 300          | 308        | 90.417         | 88.497         | 1.620          | Open Manhole     | 2000                  |
| 1.008 | o           | 300          | 1          | 89.350         | 87.376         | 1.674          | Open Manhole     | 1500                  |
| 2.000 | o           | 225          | 2          | 89.317         | 87.242         | 1.850          | Open Manhole     | 1200                  |
| 1.009 | o           | 300          | 3          | 89.000         | 86.726         | 1.974          | Open Manhole     | 1500                  |
| 3.000 | o           | 225          | 228        | 94.053         | 92.328         | 1.500          | Open Manhole     | 1800                  |
| 3.001 | o           | 300          | 229        | 93.109         | 91.308         | 1.501          | Open Manhole     | 1800                  |
| 3.002 | o           | 300          | 230        | 93.104         | 91.051         | 1.753          | Open Manhole     | 1800                  |
| 3.003 | o           | 450          | 231        | 92.627         | 88.319         | 3.858          | Open Manhole     | 1800                  |
| 3.004 | o           | 450          | 232        | 92.410         | 88.248         | 3.712          | Open Manhole     | 1800                  |
| 3.005 | o           | 450          | 233        | 91.272         | 88.199         | 2.623          | Open Manhole     | 1800                  |
| 4.000 | o           | 225          | 201        | 95.631         | 93.500         | 1.906          | Open Manhole     | 1800                  |
| 4.001 | o           | 225          | 202        | 94.330         | 92.604         | 1.501          | Open Manhole     | 1800                  |
| 4.002 | o           | 450          | 203        | 93.557         | 91.000         | 2.107          | Open Manhole     | 1800                  |

Downstream Manhole

| PN    | Length<br>(m) | Slope<br>(1:X) | MH<br>Name | C.Level<br>(m) | I.Level<br>(m) | D.Depth<br>(m) | MH<br>Connection | MH DIAM., L*W<br>(mm) |
|-------|---------------|----------------|------------|----------------|----------------|----------------|------------------|-----------------------|
| 1.000 | 11.032        | 69.8           | 302        | 92.934         | 90.762         | 1.947          | Open Manhole     | 1200                  |
| 1.001 | 47.292        | 150.1          | 303        | 92.346         | 90.447         | 1.674          | Open Manhole     | 1500                  |
| 1.002 | 25.773        | 149.8          | 304        | 92.220         | 90.275         | 1.720          | Open Manhole     | 1500                  |
| 1.003 | 27.917        | 42.0           | 305        | 91.529         | 89.535         | 1.694          | Open Manhole     | 1500                  |
| 1.004 | 17.748        | 52.5           | 306        | 91.072         | 89.197         | 1.575          | Open Manhole     | 1500                  |
| 1.005 | 22.431        | 39.7           | 307        | 90.507         | 88.632         | 1.575          | Open Manhole     | 1500                  |
| 1.006 | 20.291        | 150.3          | 308        | 90.417         | 88.497         | 1.620          | Open Manhole     | 2000                  |
| 1.007 | 26.839        | 23.9           | 1          | 89.350         | 87.374         | 1.676          | Open Manhole     | 1500                  |
| 1.008 | 28.859        | 44.4           | 3          | 89.000         | 86.726         | 1.974          | Open Manhole     | 1500                  |
| 2.000 | 6.543         | 20.6           | 3          | 89.000         | 86.925         | 1.850          | Open Manhole     | 1500                  |
| 1.009 | 101.942       | 138.7          | 5          | 87.612         | 85.991         | 1.321          | Open Manhole     | 2400                  |
| 3.000 | 58.375        | 61.8           | 229        | 93.109         | 91.383         | 1.501          | Open Manhole     | 1800                  |
| 3.001 | 43.118        | 167.8          | 230        | 93.104         | 91.051         | 1.753          | Open Manhole     | 1800                  |
| 3.002 | 57.818        | 168.1          | 231        | 92.627         | 90.707         | 1.620          | Open Manhole     | 1800                  |
| 3.003 | 28.230        | 397.6          | 232        | 92.410         | 88.248         | 3.712          | Open Manhole     | 1800                  |
| 3.004 | 19.466        | 397.3          | 233        | 91.272         | 88.199         | 2.623          | Open Manhole     | 1800                  |
| 3.005 | 19.325        | 402.6          | 234        | 89.871         | 88.151         | 1.270          | Open Manhole     | 2100                  |
| 4.000 | 20.439        | 22.8           | 202        | 94.330         | 92.604         | 1.501          | Open Manhole     | 1800                  |
| 4.001 | 15.197        | 21.6           | 203        | 93.557         | 91.902         | 1.430          | Open Manhole     | 1800                  |
| 4.002 | 10.803        | 77.2           | 204        | 93.311         | 90.860         | 2.001          | Open Manhole     | 1800                  |

|                                                  |                                          |                                                                                    |
|--------------------------------------------------|------------------------------------------|------------------------------------------------------------------------------------|
| Coopers                                          |                                          | Page 11                                                                            |
| Park House<br>Sandpiper Court<br>Chester CH4 9QU | EDGEHILL PHASE 2<br>CUMBRIA<br>SW Design |  |
| Date 01/05/2019                                  | Designed by Coopers                      |                                                                                    |
| File 7503 3A + Planning.MDX                      | Checked by                               |                                                                                    |
| Micro Drainage                                   | Network 2018.1.1                         |                                                                                    |

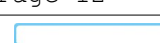
PIPELINE SCHEDULES for Phase 2+3a new layout 21.3.5.SWS

Upstream Manhole

| PN    | Hyd Sect | Diam (mm) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|----------|-----------|---------|-------------|-------------|-------------|---------------|--------------------|
| 4.003 | o        | 450       | 204     | 93.311      | 90.860      | 2.001       | Open Manhole  | 1800               |
| 4.004 | o        | 450       | 205     | 92.291      | 90.341      | 1.500       | Open Manhole  | 1800               |
| 4.005 | o        | 450       | 206     | 92.246      | 90.083      | 1.713       | Open Manhole  | 1800               |
| 5.000 | o        | 225       | 207     | 93.660      | 91.935      | 1.500       | Open Manhole  | 1800               |
| 6.000 | o        | 225       | 208     | 94.241      | 92.516      | 1.500       | Open Manhole  | 1800               |
| 6.001 | o        | 300       | 209     | 93.200      | 91.475      | 1.425       | Open Manhole  | 1800               |
| 6.002 | o        | 300       | 210     | 92.938      | 91.213      | 1.425       | Open Manhole  | 1800               |
| 5.001 | o        | 450       | 211     | 92.445      | 90.529      | 1.466       | Open Manhole  | 1800               |
| 4.006 | o        | 450       | 212     | 91.780      | 89.702      | 1.628       | Open Manhole  | 2100               |
| 7.000 | o        | 225       | 213     | 92.500      | 90.775      | 1.500       | Open Manhole  | 1800               |
| 4.007 | o        | 450       | 214     | 92.153      | 89.123      | 2.580       | Open Manhole  | 2100               |
| 4.008 | o        | 450       | 215     | 92.535      | 89.006      | 3.079       | Open Manhole  | 2100               |
| 8.000 | o        | 225       | 216     | 93.200      | 91.475      | 1.500       | Open Manhole  | 1800               |
| 8.001 | o        | 300       | 217     | 93.400      | 91.280      | 1.820       | Open Manhole  | 1800               |
| 8.002 | o        | 300       | 218     | 92.170      | 90.370      | 1.500       | Open Manhole  | 1800               |
| 8.003 | o        | 300       | 219     | 91.665      | 89.865      | 1.500       | Open Manhole  | 1800               |
| 4.009 | o        | 450       | 220     | 92.369      | 88.959      | 2.960       | Open Manhole  | 2100               |

Downstream Manhole

| PN    | Length (m) | Slope (1:X) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|------------|-------------|---------|-------------|-------------|-------------|---------------|--------------------|
| 4.003 | 26.856     | 51.7        | 205     | 92.291      | 90.341      | 1.500       | Open Manhole  | 1800               |
| 4.004 | 43.276     | 167.7       | 206     | 92.246      | 90.083      | 1.713       | Open Manhole  | 1800               |
| 4.005 | 39.069     | 102.5       | 212     | 91.780      | 89.702      | 1.628       | Open Manhole  | 2100               |
| 5.000 | 36.031     | 30.5        | 211     | 92.445      | 90.754      | 1.466       | Open Manhole  | 1800               |
| 6.000 | 39.674     | 41.1        | 209     | 93.200      | 91.551      | 1.424       | Open Manhole  | 1800               |
| 6.001 | 20.987     | 80.1        | 210     | 92.938      | 91.213      | 1.425       | Open Manhole  | 1800               |
| 6.002 | 47.235     | 88.5        | 211     | 92.445      | 90.679      | 1.466       | Open Manhole  | 1800               |
| 5.001 | 56.048     | 67.8        | 212     | 91.780      | 89.702      | 1.628       | Open Manhole  | 2100               |
| 4.006 | 10.667     | 77.9        | 214     | 92.153      | 89.565      | 2.138       | Open Manhole  | 2100               |
| 7.000 | 10.669     | 10.9        | 214     | 92.153      | 89.795      | 2.133       | Open Manhole  | 2100               |
| 4.007 | 46.819     | 400.2       | 215     | 92.535      | 89.006      | 3.079       | Open Manhole  | 2100               |
| 4.008 | 18.860     | 401.3       | 220     | 92.369      | 88.959      | 2.960       | Open Manhole  | 2100               |
| 8.000 | 9.564      | 79.7        | 217     | 93.400      | 91.355      | 1.820       | Open Manhole  | 1800               |
| 8.001 | 37.117     | 40.8        | 218     | 92.170      | 90.370      | 1.500       | Open Manhole  | 1800               |
| 8.002 | 46.345     | 91.8        | 219     | 91.665      | 89.865      | 1.500       | Open Manhole  | 1800               |
| 8.003 | 21.675     | 40.8        | 220     | 92.369      | 89.334      | 2.735       | Open Manhole  | 2100               |
| 4.009 | 25.674     | 401.2       | 221     | 92.288      | 88.895      | 2.943       | Open Manhole  | 2100               |

|                                                  |                                          |                                                                                    |
|--------------------------------------------------|------------------------------------------|------------------------------------------------------------------------------------|
| Coopers                                          |                                          | Page 12                                                                            |
| Park House<br>Sandpiper Court<br>Chester CH4 9QU | EDGEHILL PHASE 2<br>CUMBRIA<br>SW Design |  |
| Date 01/05/2019                                  | Designed by Coopers                      |                                                                                    |
| File 7503 3A + Planning.MDX                      | Checked by                               |                                                                                    |
| Micro Drainage                                   | Network 2018.1.1                         |                                                                                    |

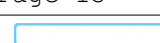
PIPELINE SCHEDULES for Phase 2+3a new layout 21.3.5.SWS

Upstream Manhole

| PN     | Hyd<br>Sect | Diam<br>(mm) | MH<br>Name | C.Level<br>(m) | I.Level<br>(m) | D.Depth<br>(m) | MH<br>Connection | MH DIAM., L*W<br>(mm) |
|--------|-------------|--------------|------------|----------------|----------------|----------------|------------------|-----------------------|
| 4.010  | o           | 450          | 221        | 92.288         | 88.895         | 2.943          | Open Manhole     | 2100                  |
| 4.011  | o           | 450          | 222        | 92.554         | 88.851         | 3.253          | Open Manhole     | 2100                  |
| 4.012  | o           | 450          | 223        | 92.707         | 88.714         | 3.543          | Open Manhole     | 2100                  |
| 4.013  | o           | 450          | 224        | 92.063         | 88.654         | 2.959          | Open Manhole     | 2100                  |
| 4.014  | o           | 450          | 225        | 90.600         | 87.685         | 2.465          | Open Manhole     | 2100                  |
| 4.015  | o           | 450          | 226        | 90.123         | 87.294         | 2.379          | Open Manhole     | 1800                  |
| 4.016  | o           | 450          | 227        | 89.642         | 87.223         | 1.969          | Open Manhole     | 1800                  |
| 3.006  | o           | 450          | 234        | 89.871         | 86.921         | 2.500          | Open Manhole     | 2100                  |
| 1.010  | o           | 675          | 5          | 87.612         | 83.519         | 3.418          | Open Manhole     | 2400                  |
| 9.000  | o           | 225          | 6          | 86.140         | 84.365         | 1.550          | Open Manhole     | 1500                  |
| 9.001  | o           | 225          | 7          | 85.836         | 84.061         | 1.550          | Open Manhole     | 1200                  |
| 9.002  | o           | 225          | 8          | 85.460         | 83.685         | 1.550          | Open Manhole     | 1200                  |
| 9.003  | o           | 300          | 9          | 85.121         | 83.271         | 1.550          | Open Manhole     | 1500                  |
| 9.004  | o           | 300          | 10         | 84.553         | 82.814         | 1.439          | Open Manhole     | 1350                  |
| 1.011  | o           | 675          | 11         | 84.815         | 82.229         | 1.911          | Open Manhole     | 1800                  |
| 1.012  | o           | 675          | 12         | 84.270         | 82.200         | 1.395          | Open Manhole     | 1800                  |
| 1.013  | o           | 675          | 13         | 83.408         | 81.166         | 1.567          | Open Manhole     | 1800                  |
| 10.000 | o           | 225          | 14A        | 85.850         | 84.125         | 1.500          | Open Manhole     | 1200                  |
| 10.001 | o           | 225          | 14         | 84.400         | 82.670         | 1.505          | Open Manhole     | 1200                  |

Downstream Manhole

| PN     | Length<br>(m) | Slope<br>(1:X) | MH<br>Name | C.Level<br>(m) | I.Level<br>(m) | D.Depth<br>(m) | MH<br>Connection | MH DIAM., L*W<br>(mm) |
|--------|---------------|----------------|------------|----------------|----------------|----------------|------------------|-----------------------|
| 4.010  | 17.517        | 398.1          | 222        | 92.554         | 88.851         | 3.253          | Open Manhole     | 2100                  |
| 4.011  | 54.799        | 400.0          | 223        | 92.707         | 88.714         | 3.543          | Open Manhole     | 2100                  |
| 4.012  | 24.003        | 400.1          | 224        | 92.063         | 88.654         | 2.959          | Open Manhole     | 2100                  |
| 4.013  | 51.144        | 52.8           | 225        | 90.600         | 87.685         | 2.465          | Open Manhole     | 2100                  |
| 4.014  | 19.107        | 48.9           | 226        | 90.123         | 87.294         | 2.379          | Open Manhole     | 1800                  |
| 4.015  | 19.801        | 278.9          | 227        | 89.642         | 87.223         | 1.969          | Open Manhole     | 1800                  |
| 4.016  | 38.359        | 127.0          | 234        | 89.871         | 86.921         | 2.500          | Open Manhole     | 2100                  |
| 3.006  | 44.143        | 32.0           | 5          | 87.612         | 85.542         | 1.620          | Open Manhole     | 2400                  |
| 1.010  | 61.448        | 47.6           | 11         | 84.815         | 82.229         | 1.911          | Open Manhole     | 1800                  |
| 9.000  | 21.362        | 70.3           | 7          | 85.836         | 84.061         | 1.550          | Open Manhole     | 1200                  |
| 9.001  | 25.623        | 68.1           | 8          | 85.460         | 83.685         | 1.550          | Open Manhole     | 1200                  |
| 9.002  | 24.293        | 71.7           | 9          | 85.121         | 83.346         | 1.550          | Open Manhole     | 1500                  |
| 9.003  | 46.600        | 102.0          | 10         | 84.553         | 82.814         | 1.439          | Open Manhole     | 1350                  |
| 9.004  | 50.347        | 239.7          | 11         | 84.815         | 82.604         | 1.911          | Open Manhole     | 1800                  |
| 1.011  | 11.781        | 406.2          | 12         | 84.270         | 82.200         | 1.395          | Open Manhole     | 1800                  |
| 1.012  | 46.517        | 45.0           | 13         | 83.408         | 81.166         | 1.567          | Open Manhole     | 1800                  |
| 1.013  | 24.120        | 67.0           | 15         | 82.945         | 80.806         | 1.464          | Open Manhole     | 1800                  |
| 10.000 | 21.739        | 15.2           | 14         | 84.400         | 82.694         | 1.481          | Open Manhole     | 1200                  |
| 10.001 | 28.254        | 20.0           | 15         | 82.945         | 81.256         | 1.464          | Open Manhole     | 1800                  |

|                                                  |                                          |                                                                                    |
|--------------------------------------------------|------------------------------------------|------------------------------------------------------------------------------------|
| Coopers                                          |                                          | Page 13                                                                            |
| Park House<br>Sandpiper Court<br>Chester CH4 9QU | EDGEHILL PHASE 2<br>CUMBRIA<br>SW Design |  |
| Date 01/05/2019                                  | Designed by Coopers                      |                                                                                    |
| File 7503 3A + Planning.MDX                      | Checked by                               |                                                                                    |
| Micro Drainage                                   | Network 2018.1.1                         |                                                                                    |

PIPELINE SCHEDULES for Phase 2+3a new layout 21.3.5.SWS

Upstream Manhole

| PN     | Hyd<br>Sect | Diam<br>(mm) | MH<br>Name | C.Level<br>(m) | I.Level<br>(m) | D.Depth<br>(m) | MH<br>Connection | MH DIAM., L*W<br>(mm) |
|--------|-------------|--------------|------------|----------------|----------------|----------------|------------------|-----------------------|
| 1.014  | o           | 675          | 15         | 82.945         | 80.806         | 1.464          | Open Manhole     | 1800                  |
| 1.015  | o           | 675          | 16         | 82.900         | 80.558         | 1.667          | Open Manhole     | 1800                  |
| 11.000 | o           | 225          | 17         | 85.450         | 83.685         | 1.540          | Open Manhole     | 1500                  |
| 12.000 | o           | 225          | 101        | 95.421         | 93.825         | 1.371          | Open Manhole     | 1500                  |
| 12.001 | o           | 225          | 102        | 95.658         | 93.177         | 2.256          | Open Manhole     | 1500                  |
| 12.002 | o           | 225          | 103        | 93.939         | 90.714         | 3.000          | Open Manhole     | 1500                  |
| 12.003 | o           | 300          | 104        | 92.227         | 90.374         | 1.553          | Open Manhole     | 1500                  |
| 12.004 | o           | 300          | 105        | 91.823         | 90.181         | 1.342          | Open Manhole     | 1500                  |
| 12.005 | o           | 300          | 106        | 90.962         | 89.265         | 1.397          | Open Manhole     | 1500                  |
| 13.000 | o           | 225          | 107        | 98.004         | 96.586         | 1.193          | Open Manhole     | 1500                  |
| 13.001 | o           | 225          | 108        | 96.719         | 95.300         | 1.194          | Open Manhole     | 1500                  |
| 13.002 | o           | 225          | 109        | 95.611         | 94.199         | 1.187          | Open Manhole     | 1500                  |
| 13.003 | o           | 300          | 110        | 94.713         | 92.892         | 1.521          | Open Manhole     | 1500                  |
| 13.004 | o           | 300          | 111        | 94.804         | 92.750         | 1.754          | Open Manhole     | 1500                  |
| 14.000 | o           | 225          | 112        | 95.343         | 93.611         | 1.507          | Open Manhole     | 1500                  |
| 14.001 | o           | 225          | 113        | 94.764         | 93.035         | 1.504          | Open Manhole     | 1500                  |
| 14.002 | o           | 225          | 114        | 94.477         | 92.930         | 1.322          | Open Manhole     | 1500                  |
| 13.005 | o           | 300          | 115        | 94.328         | 92.567         | 1.461          | Open Manhole     | 1500                  |
| 13.006 | o           | 450          | 116        | 93.508         | 91.631         | 1.427          | Open Manhole     | 1800                  |
| 13.007 | o           | 450          | 117        | 92.705         | 90.796         | 1.459          | Open Manhole     | 1800                  |

Downstream Manhole

| PN     | Length<br>(m) | Slope<br>(1:X) | MH<br>Name | C.Level<br>(m) | I.Level<br>(m) | D.Depth<br>(m) | MH<br>Connection | MH DIAM., L*W<br>(mm) |
|--------|---------------|----------------|------------|----------------|----------------|----------------|------------------|-----------------------|
| 1.014  | 12.639        | 51.0           | 16         | 82.900         | 80.558         | 1.667          | Open Manhole     | 1800                  |
| 1.015  | 29.584        | 79.3           | 20         | 83.055         | 80.185         | 2.195          | Open Manhole     | 2400                  |
| 11.000 | 13.070        | 169.7          | 18         | 85.034         | 83.608         | 1.201          | Open Manhole     | 1500                  |
| 12.000 | 45.344        | 70.0           | 102        | 95.658         | 93.177         | 2.256          | Open Manhole     | 1500                  |
| 12.001 | 34.363        | 54.0           | 103        | 93.939         | 92.541         | 1.173          | Open Manhole     | 1500                  |
| 12.002 | 44.603        | 168.3          | 104        | 92.227         | 90.449         | 1.553          | Open Manhole     | 1500                  |
| 12.003 | 28.940        | 149.9          | 105        | 91.823         | 90.181         | 1.342          | Open Manhole     | 1500                  |
| 12.004 | 21.988        | 24.0           | 106        | 90.962         | 89.265         | 1.397          | Open Manhole     | 1500                  |
| 12.005 | 16.892        | 16.7           | 120        | 89.831         | 88.253         | 1.278          | Open Manhole     | 1800                  |
| 13.000 | 41.136        | 32.0           | 108        | 96.719         | 95.300         | 1.194          | Open Manhole     | 1500                  |
| 13.001 | 35.630        | 32.4           | 109        | 95.611         | 94.199         | 1.187          | Open Manhole     | 1500                  |
| 13.002 | 34.499        | 28.0           | 110        | 94.713         | 92.967         | 1.521          | Open Manhole     | 1500                  |
| 13.003 | 21.353        | 150.4          | 111        | 94.804         | 92.750         | 1.754          | Open Manhole     | 1500                  |
| 13.004 | 16.052        | 87.7           | 115        | 94.328         | 92.567         | 1.461          | Open Manhole     | 1500                  |
| 14.000 | 31.679        | 55.0           | 113        | 94.764         | 93.035         | 1.504          | Open Manhole     | 1500                  |
| 14.001 | 15.813        | 150.6          | 114        | 94.477         | 92.930         | 1.322          | Open Manhole     | 1500                  |
| 14.002 | 17.647        | 61.5           | 115        | 94.328         | 92.643         | 1.460          | Open Manhole     | 1500                  |
| 13.005 | 21.223        | 27.0           | 116        | 93.508         | 91.781         | 1.427          | Open Manhole     | 1800                  |
| 13.006 | 40.929        | 49.0           | 117        | 92.705         | 90.796         | 1.459          | Open Manhole     | 1800                  |
| 13.007 | 22.496        | 61.0           | 118        | 92.253         | 90.427         | 1.376          | Open Manhole     | 1800                  |

|                                                  |                                          |                                                                                     |
|--------------------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------|
| Coopers                                          |                                          | Page 14                                                                             |
| Park House<br>Sandpiper Court<br>Chester CH4 9QU | EDGEHILL PHASE 2<br>CUMBRIA<br>SW Design |  |
| Date 01/05/2019                                  | Designed by Coopers                      |                                                                                     |
| File 7503 3A + Planning.MDX                      | Checked by                               |                                                                                     |
| Micro Drainage                                   | Network 2018.1.1                         |                                                                                     |

PIPELINE SCHEDULES for Phase 2+3a new layout 21.3.5.SWS

Upstream Manhole

| PN     | Hyd<br>Sect | Diam<br>(mm) | MH<br>Name | C.Level<br>(m) | I.Level<br>(m) | D.Depth<br>(m) | MH<br>Connection | MH DIAM., L*W<br>(mm) |
|--------|-------------|--------------|------------|----------------|----------------|----------------|------------------|-----------------------|
| 13.008 | o           | 450          | 118        | 92.253         | 90.427         | 1.376          | Open Manhole     | 1800                  |
| 13.009 | o           | 450          | 119        | 90.905         | 88.350         | 2.105          | Open Manhole     | 1800                  |
| 12.006 | o           | 450          | 120        | 89.831         | 86.700         | 2.681          | Open Manhole     | 1800                  |
| 12.007 | o           | 450          | 121        | 88.455         | 84.861         | 3.144          | Open Manhole     | 1800                  |
| 12.008 | o           | 450          | 122        | 86.687         | 83.599         | 2.638          | Open Manhole     | 1800                  |
| 15.000 | o           | 225          | 123        | 91.600         | 89.136         | 2.239          | Open Manhole     | 1500                  |
| 15.001 | o           | 300          | 124        | 89.200         | 87.397         | 1.503          | Open Manhole     | 1500                  |
| 15.002 | o           | 300          | 125        | 88.600         | 85.741         | 2.559          | Open Manhole     | 1500                  |
| 15.003 | o           | 300          | 126        | 87.780         | 85.025         | 2.455          | Open Manhole     | 1500                  |
| 15.004 | o           | 450          | 127        | 87.271         | 84.517         | 2.304          | Open Manhole     | 2100                  |
| 15.005 | o           | 450          | 128        | 86.530         | 84.476         | 1.604          | Open Manhole     | 2100                  |
| 12.009 | o           | 450          | 129        | 86.222         | 83.513         | 2.259          | Open Manhole     | 2100                  |
| 11.001 | o           | 450          | 18         | 85.034         | 83.384         | 1.200          | Open Manhole     | 1500                  |
| 11.002 | o           | 450          | 19         | 84.500         | 81.485         | 2.565          | Open Manhole     | 1800                  |
| 1.016  | o           | 750          | 20         | 83.055         | 77.935         | 4.370          | Open Manhole     | 2400                  |
| 1.017  | o           | 750          | 21         | 79.521         | 75.851         | 2.920          | Open Manhole     | 2400                  |
| 16.000 | o           | 225          | 22A        | 80.050         | 78.325         | 1.500          | Open Manhole     | 1200                  |
| 16.001 | o           | 225          | 22B        | 79.925         | 78.196         | 1.504          | Open Manhole     | 1200                  |
| 16.002 | o           | 225          | 22         | 79.360         | 76.545         | 2.590          | Open Manhole     | 1500                  |

Downstream Manhole

| PN     | Length<br>(m) | Slope<br>(1:X) | MH<br>Name | C.Level<br>(m) | I.Level<br>(m) | D.Depth<br>(m) | MH<br>Connection | MH DIAM., L*W<br>(mm) |
|--------|---------------|----------------|------------|----------------|----------------|----------------|------------------|-----------------------|
| 13.008 | 32.650        | 26.0           | 119        | 90.905         | 89.171         | 1.284          | Open Manhole     | 1800                  |
| 13.009 | 25.532        | 103.0          | 120        | 89.831         | 88.102         | 1.279          | Open Manhole     | 1800                  |
| 12.006 | 20.720        | 398.5          | 121        | 88.455         | 86.648         | 1.357          | Open Manhole     | 1800                  |
| 12.007 | 34.790        | 390.9          | 122        | 86.687         | 84.772         | 1.465          | Open Manhole     | 1800                  |
| 12.008 | 35.143        | 408.6          | 129        | 86.222         | 83.513         | 2.259          | Open Manhole     | 2100                  |
| 15.000 | 63.225        | 38.0           | 124        | 89.200         | 87.472         | 1.503          | Open Manhole     | 1500                  |
| 15.001 | 28.234        | 54.0           | 125        | 88.600         | 86.874         | 1.426          | Open Manhole     | 1500                  |
| 15.002 | 21.480        | 30.0           | 126        | 87.780         | 85.025         | 2.455          | Open Manhole     | 1500                  |
| 15.003 | 10.725        | 30.0           | 127        | 87.271         | 84.667         | 2.304          | Open Manhole     | 2100                  |
| 15.004 | 16.244        | 396.2          | 128        | 86.530         | 84.476         | 1.604          | Open Manhole     | 2100                  |
| 15.005 | 13.983        | 399.5          | 129        | 86.222         | 84.441         | 1.331          | Open Manhole     | 2100                  |
| 12.009 | 26.369        | 204.4          | 18         | 85.034         | 83.384         | 1.200          | Open Manhole     | 1500                  |
| 11.001 | 27.953        | 30.9           | 19         | 84.500         | 82.480         | 1.570          | Open Manhole     | 1800                  |
| 11.002 | 27.953        | 26.0           | 20         | 83.055         | 80.410         | 2.195          | Open Manhole     | 2400                  |
| 1.016  | 46.235        | 78.5           | 21         | 79.521         | 77.346         | 1.425          | Open Manhole     | 2400                  |
| 1.017  | 34.247        | 83.5           | 23         | 77.691         | 75.441         | 1.500          | Open Manhole     | 2400                  |
| 16.000 | 21.861        | 169.5          | 22B        | 79.925         | 78.196         | 1.504          | Open Manhole     | 1200                  |
| 16.001 | 18.916        | 11.5           | 22         | 79.360         | 76.545         | 2.590          | Open Manhole     | 1500                  |
| 16.002 | 14.610        | 11.0           | 23         | 77.691         | 75.217         | 2.249          | Open Manhole     | 2400                  |

|                                                  |                                          |                                                                                     |
|--------------------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------|
| Coopers                                          |                                          | Page 15                                                                             |
| Park House<br>Sandpiper Court<br>Chester CH4 9QU | EDGEHILL PHASE 2<br>CUMBRIA<br>SW Design |  |
| Date 01/05/2019                                  | Designed by Coopers                      |                                                                                     |
| File 7503 3A + Planning.MDX                      | Checked by                               |                                                                                     |
| Micro Drainage                                   |                                          | Network 2018.1.1                                                                    |

PIPELINE SCHEDULES for Phase 2+3a new layout 21.3.5.SWS

Upstream Manhole

| PN     | Hyd Sect | Diam (mm) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|--------|----------|-----------|---------|-------------|-------------|-------------|---------------|--------------------|
| 1.018  | o        | 750       | 23      | 77.691      | 73.191      | 3.750       | Open Manhole  | 2400               |
| 17.000 | o        | 225       | 24A     | 74.450      | 72.725      | 1.500       | Open Manhole  | 1200               |
| 17.001 | o        | 225       | 24B     | 74.850      | 72.613      | 2.012       | Open Manhole  | 1200               |
| 17.002 | o        | 225       | 24C     | 76.500      | 72.405      | 3.870       | Open Manhole  | 1200               |
| 1.019  | o        | 750       | 24      | 76.000      | 70.762      | 4.488       | Open Manhole  | 2400               |
| 1.020  | o        | 750       | 25      | 73.500      | 68.562      | 4.188       | Open Manhole  | 2400               |
| 1.021  | o        | 750       | 26      | 70.610      | 65.605      | 4.255       | Open Manhole  | 2400               |
| 1.022  | o        | 750       | 27      | 66.500      | 64.185      | 1.565       | Open Manhole  | 2400               |
| 1.023  | o        | 450       | 28      | 64.600      | 62.988      | 1.162       | Open Manhole  | 1800               |
| 1.024  | o        | 450       | 29      | 62.750      | 59.470      | 2.830       | Open Manhole  | 1500               |

Downstream Manhole

| PN     | Length (m) | Slope (1:X) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|--------|------------|-------------|---------|-------------|-------------|-------------|---------------|--------------------|
| 1.018  | 20.718     | 48.2        | 24      | 76.000      | 72.761      | 2.489       | Open Manhole  | 2400               |
| 17.000 | 19.124     | 170.8       | 24B     | 74.850      | 72.613      | 2.012       | Open Manhole  | 1200               |
| 17.001 | 35.278     | 169.6       | 24C     | 76.500      | 72.405      | 3.870       | Open Manhole  | 1200               |
| 17.002 | 23.191     | 73.6        | 24      | 76.000      | 72.090      | 3.685       | Open Manhole  | 2400               |
| 1.019  | 13.163     | 65.8        | 25      | 73.500      | 70.562      | 2.188       | Open Manhole  | 2400               |
| 1.020  | 29.678     | 42.8        | 26      | 70.610      | 67.868      | 1.992       | Open Manhole  | 2400               |
| 1.021  | 71.017     | 50.0        | 27      | 66.500      | 64.185      | 1.565       | Open Manhole  | 2400               |
| 1.022  | 24.246#    | 50.0        | 28      | 64.600      | 63.700      | 0.150       | Open Manhole  | 1800               |
| 1.023  | 46.344     | 24.0        | 29      | 62.750      | 61.058      | 1.242       | Open Manhole  | 1500               |
| 1.024  | 16.932     | 99.6        | 30      | 60.250      | 59.300      | 0.500       | Open Manhole  | 0                  |

Free Flowing Outfall Details for Phase 2+3a new layout 21.3.5.SWS

| Outfall Pipe Number | Outfall Name | C. Level (m) | I. Level (m) | Min I. Level (m) | D,L (mm) | W (mm) |
|---------------------|--------------|--------------|--------------|------------------|----------|--------|
|---------------------|--------------|--------------|--------------|------------------|----------|--------|

|       |    |        |        |       |   |   |
|-------|----|--------|--------|-------|---|---|
| 1.024 | 30 | 60.250 | 59.300 | 0.000 | 0 | 0 |
|-------|----|--------|--------|-------|---|---|

Simulation Criteria for Phase 2+3a new layout 21.3.5.SWS

|                                 |       |                                     |       |
|---------------------------------|-------|-------------------------------------|-------|
| Volumetric Runoff Coeff         | 0.750 | Additional Flow - % of Total Flow   | 0.000 |
| Areal Reduction Factor          | 1.000 | MADD Factor * 10m³/ha Storage       | 2.000 |
| Hot Start (mins)                | 0     | Inlet Coefficient                   | 0.800 |
| Hot Start Level (mm)            | 0     | Flow per Person per Day (l/per/day) | 0.000 |
| Manhole Headloss Coeff (Global) | 0.500 | Run Time (mins)                     | 60    |
| Foul Sewage per hectare (l/s)   | 0.000 | Output Interval (mins)              | 1     |

Number of Input Hydrographs 0    Number of Offline Controls 0    Number of Time/Area Diagrams 0  
Number of Online Controls 1    Number of Storage Structures 4    Number of Real Time Controls 0

Synthetic Rainfall Details

|                             |                     |                                                                                     |
|-----------------------------|---------------------|-------------------------------------------------------------------------------------|
| Coopers                     |                     | Page 16                                                                             |
| Park House                  | EDGEHILL PHASE 2    |  |
| Sandpiper Court             | CUMBRIA             |                                                                                     |
| Chester CH4 9QU             | SW Design           |                                                                                     |
| Date 01/05/2019             | Designed by Coopers |                                                                                     |
| File 7503 3A + Planning.MDX | Checked by          |                                                                                     |
| Micro Drainage              | Network 2018.1.1    |                                                                                     |

Synthetic Rainfall Details

|                       |                   |                       |        |
|-----------------------|-------------------|-----------------------|--------|
| Rainfall Model        | FSR               | Profile Type          | Summer |
| Return Period (years) | 2                 | Cv (Summer)           | 0.750  |
| Region                | England and Wales | Cv (Winter)           | 0.840  |
| M5-60 (mm)            | 16.000            | Storm Duration (mins) | 30     |
| Ratio R               | 0.268             |                       |        |

|                                                  |                                          |                                                                                     |
|--------------------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------|
| Coopers                                          |                                          | Page 17                                                                             |
| Park House<br>Sandpiper Court<br>Chester CH4 9QU | EDGEHILL PHASE 2<br>CUMBRIA<br>SW Design |  |
| Date 01/05/2019                                  | Designed by Coopers                      |                                                                                     |
| File 7503 3A + Planning.MDX                      | Checked by                               |                                                                                     |
| Micro Drainage                                   | Network 2018.1.1                         |                                                                                     |

### Online Controls for Phase 2+3a new layout 21.3.5.SWS

Hydro-Brake® Optimum Manhole: 28, DS/PN: 1.023, Volume (m³): 13.9

|                                   |                                                    |
|-----------------------------------|----------------------------------------------------|
| Unit Reference                    | MD-SHE-0416-1135-1000-1135                         |
| Design Head (m)                   | 1.000                                              |
| Design Flow (l/s)                 | 113.5                                              |
| Flush-Flo™                        | Calculated                                         |
| Objective                         | Minimise upstream storage                          |
| Application                       | Surface                                            |
| Sump Available                    | Yes                                                |
| Diameter (mm)                     | 416                                                |
| Invert Level (m)                  | 62.988                                             |
| Minimum Outlet Pipe Diameter (mm) | 450                                                |
| Suggested Manhole Diameter (mm)   | Site Specific Design (Contact Hydro International) |

| Control Points            | Head (m) | Flow (l/s) | Control Points            | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|---------------------------|----------|------------|
| Design Point (Calculated) | 1.000    | 113.4      | Kick-Flo®                 | 0.862    | 105.6      |
| Flush-Flo™                | 0.575    | 113.4      | Mean Flow over Head Range | -        | 85.2       |

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

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0.100     | 11.3       | 0.800     | 108.7      | 2.000     | 159.0      | 4.000     | 223.2      | 7.000     | 293.7      |
| 0.200     | 40.6       | 1.000     | 113.4      | 2.200     | 166.6      | 4.500     | 236.4      | 7.500     | 303.9      |
| 0.300     | 79.2       | 1.200     | 124.0      | 2.400     | 173.8      | 5.000     | 249.0      | 8.000     | 313.7      |
| 0.400     | 109.7      | 1.400     | 133.6      | 2.600     | 180.7      | 5.500     | 260.9      | 8.500     | 323.1      |
| 0.500     | 112.8      | 1.600     | 142.6      | 3.000     | 193.8      | 6.000     | 272.3      | 9.000     | 332.4      |
| 0.600     | 113.3      | 1.800     | 151.0      | 3.500     | 209.0      | 6.500     | 283.2      | 9.500     | 341.3      |

|                                                  |                                          |                                                                                     |
|--------------------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------|
| Coopers                                          |                                          | Page 18                                                                             |
| Park House<br>Sandpiper Court<br>Chester CH4 9QU | EDGEHILL PHASE 2<br>CUMBRIA<br>SW Design |  |
| Date 01/05/2019                                  | Designed by Coopers                      |                                                                                     |
| File 7503 3A + Planning.MDX                      | Checked by                               |                                                                                     |
| Micro Drainage                                   | Network 2018.1.1                         |                                                                                     |

Storage Structures for Phase 2+3a new layout 21.3.5.SWS

Tank or Pond Manhole: 308, DS/PN: 1.007

Invert Level (m) 88.871

| Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------|------------------------|-----------|------------------------|
| 0.000     | 30.0                   | 0.800     | 30.0                   | 0.801     | 0.0                    |

Tank or Pond Manhole: 206, DS/PN: 4.005

Invert Level (m) 90.993

| Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------|------------------------|-----------|------------------------|
| 0.000     | 80.0                   | 0.400     | 80.0                   | 0.401     | 0.0                    |

Tank or Pond Manhole: 214, DS/PN: 4.007

Invert Level (m) 90.708

| Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------|------------------------|-----------|------------------------|
| 0.000     | 84.0                   | 0.800     | 84.0                   | 0.801     | 0.0                    |

Tank or Pond Manhole: 28, DS/PN: 1.023

Invert Level (m) 62.988

| Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------|------------------------|-----------|------------------------|-----------|------------------------|-----------|------------------------|
| 0.000     | 4000.0                 | 1.200     | 5258.0                 | 2.400     | 0.0                    | 3.600     | 0.0                    | 4.800     | 0.0                    |
| 0.200     | 4200.0                 | 1.400     | 5482.0                 | 2.600     | 0.0                    | 3.800     | 0.0                    | 5.000     | 0.0                    |
| 0.400     | 4403.0                 | 1.600     | 0.0                    | 2.800     | 0.0                    | 4.000     | 0.0                    |           |                        |
| 0.600     | 4611.0                 | 1.800     | 0.0                    | 3.000     | 0.0                    | 4.200     | 0.0                    |           |                        |
| 0.800     | 4823.0                 | 2.000     | 0.0                    | 3.200     | 0.0                    | 4.400     | 0.0                    |           |                        |
| 1.000     | 5038.0                 | 2.200     | 0.0                    | 3.400     | 0.0                    | 4.600     | 0.0                    |           |                        |

|                                                  |                                          |                                                                                     |
|--------------------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------|
| Coopers                                          |                                          | Page 19                                                                             |
| Park House<br>Sandpiper Court<br>Chester CH4 9QU | EDGEHILL PHASE 2<br>CUMBRIA<br>SW Design |  |
| Date 01/05/2019                                  | Designed by Coopers                      |                                                                                     |
| File 7503 3A + Planning.MDX                      | Checked by                               |                                                                                     |
| Micro Drainage                                   | Network 2018.1.1                         |                                                                                     |

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Phase 2+3a  
new layout 21.3.5.SWS

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000  
Hot Start (mins) 0 MADD Factor \* 10m<sup>3</sup>/ha Storage 2.000  
Hot Start Level (mm) 0 Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0  
Number of Online Controls 1 Number of Storage Structures 4 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 16.000 Cv (Summer) 0.750  
Region England and Wales Ratio R 0.267 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON  
Analysis Timestep Fine Inertia Status ON  
DTS Status OFF

Profile(s) Summer and Winter  
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960,  
1440, 2160, 2880  
Return Period(s) (years) 1, 30, 100  
Climate Change (%) 0, 0, 40

| US/MH |      | Return Climate |        | First (X) |               | First (Y)     |          | First (Z) |      | Water     | Surcharged |
|-------|------|----------------|--------|-----------|---------------|---------------|----------|-----------|------|-----------|------------|
| PN    | Name | Storm          | Period | Change    | Surcharge     | Flood         | Overflow | Overflow  | Act. | Level (m) | Depth (m)  |
| 1.000 | 301  | 15 Winter      | 1      | +0%       | 30/15 Summer  | 100/15 Winter |          |           |      | 90.980    | -0.165     |
| 1.001 | 302  | 15 Winter      | 1      | +0%       | 30/15 Summer  |               |          |           |      | 90.879    | -0.108     |
| 1.002 | 303  | 15 Winter      | 1      | +0%       | 30/15 Summer  |               |          |           |      | 90.584    | -0.088     |
| 1.003 | 304  | 15 Winter      | 1      | +0%       | 100/15 Summer |               |          |           |      | 90.290    | -0.210     |
| 1.004 | 305  | 15 Winter      | 1      | +0%       | 100/15 Summer |               |          |           |      | 89.640    | -0.195     |
| 1.005 | 306  | 15 Winter      | 1      | +0%       | 100/15 Summer |               |          |           |      | 89.302    | -0.195     |
| 1.006 | 307  | 15 Winter      | 1      | +0%       | 30/15 Summer  |               |          |           |      | 88.803    | -0.129     |
| 1.007 | 308  | 15 Winter      | 1      | +0%       | 30/15 Winter  |               |          |           |      | 88.604    | -0.193     |
| 1.008 | 1    | 15 Winter      | 1      | +0%       | 30/15 Summer  |               |          |           |      | 87.509    | -0.167     |
| 2.000 | 2    | 180 Winter     | 1      | +0%       | 30/15 Summer  |               |          |           |      | 87.242    | -0.225     |
| 1.009 | 3    | 15 Winter      | 1      | +0%       | 30/15 Summer  |               |          |           |      | 86.922    | -0.104     |
| 3.000 | 228  | 15 Winter      | 1      | +0%       | 100/15 Summer |               |          |           |      | 92.388    | -0.165     |
| 3.001 | 229  | 15 Winter      | 1      | +0%       | 100/15 Summer |               |          |           |      | 91.420    | -0.188     |
| 3.002 | 230  | 15 Winter      | 1      | +0%       | 30/15 Summer  |               |          |           |      | 91.188    | -0.163     |
| 3.003 | 231  | 15 Winter      | 1      | +0%       | 100/15 Summer |               |          |           |      | 88.508    | -0.261     |
| 3.004 | 232  | 15 Winter      | 1      | +0%       | 100/15 Summer |               |          |           |      | 88.440    | -0.258     |
| 3.005 | 233  | 15 Winter      | 1      | +0%       | 100/15 Summer |               |          |           |      | 88.387    | -0.262     |
| 4.000 | 201  | 15 Winter      | 1      | +0%       |               |               |          |           |      | 93.539    | -0.186     |
| 4.001 | 202  | 15 Winter      | 1      | +0%       |               |               |          |           |      | 92.643    | -0.186     |
| 4.002 | 203  | 15 Winter      | 1      | +0%       | 100/15 Summer |               |          |           |      | 91.089    | -0.361     |
| 4.003 | 204  | 15 Winter      | 1      | +0%       | 100/15 Summer |               |          |           |      | 90.941    | -0.369     |
| 4.004 | 205  | 15 Winter      | 1      | +0%       | 30/15 Summer  |               |          |           |      | 90.452    | -0.339     |
| 4.005 | 206  | 15 Winter      | 1      | +0%       | 30/15 Summer  |               |          |           |      | 90.195    | -0.338     |
| 5.000 | 207  | 15 Winter      | 1      | +0%       | 100/15 Winter |               |          |           |      | 92.004    | -0.156     |
| 6.000 | 208  | 15 Winter      | 1      | +0%       |               |               |          |           |      | 92.578    | -0.163     |
| 6.001 | 209  | 15 Winter      | 1      | +0%       | 100/15 Summer |               |          |           |      | 91.556    | -0.219     |
| 6.002 | 210  | 15 Winter      | 1      | +0%       | 100/15 Summer |               |          |           |      | 91.311    | -0.202     |
| 5.001 | 211  | 15 Winter      | 1      | +0%       | 30/15 Winter  |               |          |           |      | 90.651    | -0.328     |
| 4.006 | 212  | 15 Winter      | 1      | +0%       | 30/15 Summer  | 100/30 Winter |          |           |      | 89.929    | -0.223     |
| 7.000 | 213  | 15 Winter      | 1      | +0%       | 100/15 Summer |               |          |           |      | 90.825    | -0.175     |

|                                                  |                                          |                                                                                     |
|--------------------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------|
| Coopers                                          |                                          | Page 20                                                                             |
| Park House<br>Sandpiper Court<br>Chester CH4 9QU | EDGEHILL PHASE 2<br>CUMBRIA<br>SW Design |  |
| Date 01/05/2019<br>File 7503 3A + Planning.MDX   | Designed by Coopers<br>Checked by        |                                                                                     |
| Micro Drainage                                   | Network 2018.1.1                         |                                                                                     |

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Phase 2+3a  
new layout 21.3.5.SWS

| PN    | US/MH<br>Name | Flooded                     |                               | Pipe          |    | Status | Level<br>Exceeded |
|-------|---------------|-----------------------------|-------------------------------|---------------|----|--------|-------------------|
|       |               | Volume<br>(m <sup>3</sup> ) | Flow / Overflow<br>Cap. (l/s) | Flow<br>(l/s) |    |        |                   |
| 1.000 | 301           | 0.000                       | 0.16                          | 8.4           | OK |        | 1                 |
| 1.001 | 302           | 0.000                       | 0.52                          | 20.9          | OK |        |                   |
| 1.002 | 303           | 0.000                       | 0.68                          | 26.7          | OK |        |                   |
| 1.003 | 304           | 0.000                       | 0.20                          | 30.4          | OK |        |                   |
| 1.004 | 305           | 0.000                       | 0.26                          | 34.9          | OK |        |                   |
| 1.005 | 306           | 0.000                       | 0.26                          | 40.9          | OK |        |                   |
| 1.006 | 307           | 0.000                       | 0.61                          | 48.4          | OK |        |                   |
| 1.007 | 308           | 0.000                       | 0.27                          | 56.4          | OK |        |                   |
| 1.008 | 1             | 0.000                       | 0.41                          | 61.7          | OK |        |                   |
| 2.000 | 2             | 0.000                       | 0.00                          | 0.0           | OK |        |                   |
| 1.009 | 3             | 0.000                       | 0.75                          | 68.7          | OK |        |                   |
| 3.000 | 228           | 0.000                       | 0.16                          | 9.9           | OK |        |                   |
| 3.001 | 229           | 0.000                       | 0.29                          | 23.3          | OK |        |                   |
| 3.002 | 230           | 0.000                       | 0.42                          | 34.5          | OK |        |                   |
| 3.003 | 231           | 0.000                       | 0.31                          | 42.8          | OK |        |                   |
| 3.004 | 232           | 0.000                       | 0.35                          | 44.7          | OK |        |                   |
| 3.005 | 233           | 0.000                       | 0.36                          | 46.0          | OK |        |                   |
| 4.000 | 201           | 0.000                       | 0.07                          | 6.9           | OK |        |                   |
| 4.001 | 202           | 0.000                       | 0.07                          | 6.9           | OK |        |                   |
| 4.002 | 203           | 0.000                       | 0.09                          | 18.1          | OK |        |                   |
| 4.003 | 204           | 0.000                       | 0.07                          | 28.4          | OK |        |                   |
| 4.004 | 205           | 0.000                       | 0.14                          | 30.5          | OK |        |                   |
| 4.005 | 206           | 0.000                       | 0.14                          | 39.5          | OK |        |                   |
| 5.000 | 207           | 0.000                       | 0.20                          | 18.1          | OK |        |                   |
| 6.000 | 208           | 0.000                       | 0.17                          | 12.8          | OK |        |                   |
| 6.001 | 209           | 0.000                       | 0.16                          | 17.4          | OK |        |                   |
| 6.002 | 210           | 0.000                       | 0.23                          | 25.7          | OK |        |                   |
| 5.001 | 211           | 0.000                       | 0.16                          | 58.8          | OK |        |                   |
| 4.006 | 212           | 0.000                       | 0.50                          | 105.1         | OK |        | 1                 |
| 7.000 | 213           | 0.000                       | 0.11                          | 14.6          | OK |        |                   |

|                                                  |                                          |                                                                                     |
|--------------------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------|
| Coopers                                          |                                          | Page 21                                                                             |
| Park House<br>Sandpiper Court<br>Chester CH4 9QU | EDGEHILL PHASE 2<br>CUMBRIA<br>SW Design |  |
| Date 01/05/2019                                  | Designed by Coopers                      |                                                                                     |
| File 7503 3A + Planning.MDX                      | Checked by                               |                                                                                     |
| Micro Drainage                                   |                                          | Network 2018.1.1                                                                    |

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Phase 2+3a  
new layout 21.3.5.SWS

| PN     | US/MH  |        | Return Period | Climate Change | First (X) |                      | First (Y) | First (Z) | Overflow Act. | Water Level | Surcharged Depth |
|--------|--------|--------|---------------|----------------|-----------|----------------------|-----------|-----------|---------------|-------------|------------------|
|        | Name   | Storm  |               |                | Surcharge | Flood                |           |           |               | (m)         | (m)              |
| 4.007  | 214 15 | Winter | 1             | +0%            | 30/15     | Summer               |           |           |               | 89.573      | 0.000            |
| 4.008  | 215 15 | Winter | 1             | +0%            | 1/15      | Summer               |           |           |               | 89.497      | 0.041            |
| 8.000  | 216 15 | Winter | 1             | +0%            | 100/30    | Winter               |           |           |               | 91.543      | -0.157           |
| 8.001  | 217 15 | Winter | 1             | +0%            | 100/30    | Summer               |           |           |               | 91.336      | -0.244           |
| 8.002  | 218 15 | Winter | 1             | +0%            | 100/15    | Summer               |           |           |               | 90.458      | -0.212           |
| 8.003  | 219 15 | Winter | 1             | +0%            | 30/15     | Summer               |           |           |               | 89.957      | -0.208           |
| 4.009  | 220 15 | Winter | 1             | +0%            | 1/15      | Summer               |           |           |               | 89.453      | 0.044            |
| 4.010  | 221 15 | Winter | 1             | +0%            | 1/15      | Winter               |           |           |               | 89.379      | 0.034            |
| 4.011  | 222 30 | Winter | 1             | +0%            | 1/15      | Winter               |           |           |               | 89.314      | 0.013            |
| 4.012  | 223 30 | Winter | 1             | +0%            | 1/15      | Winter               |           |           |               | 89.166      | 0.002            |
| 4.013  | 224 30 | Winter | 1             | +0%            | 100/15    | Summer               |           |           |               | 88.847      | -0.257           |
| 4.014  | 225 30 | Winter | 1             | +0%            | 30/15     | Summer               |           |           |               | 87.900      | -0.235           |
| 4.015  | 226 30 | Winter | 1             | +0%            | 30/15     | Summer               |           |           |               | 87.742      | -0.002           |
| 4.016  | 227 30 | Winter | 1             | +0%            | 30/15     | Summer               |           |           |               | 87.481      | -0.192           |
| 3.006  | 234 30 | Winter | 1             | +0%            | 100/15    | Summer               |           |           |               | 87.114      | -0.257           |
| 1.010  | 5 30   | Winter | 1             | +0%            |           |                      |           |           |               | 83.732      | -0.462           |
| 9.000  | 6 15   | Winter | 1             | +0%            |           |                      |           |           |               | 84.420      | -0.170           |
| 9.001  | 7 15   | Winter | 1             | +0%            | 100/15    | Winter               |           |           |               | 84.118      | -0.168           |
| 9.002  | 8 15   | Winter | 1             | +0%            | 100/15    | Summer               |           |           |               | 83.754      | -0.156           |
| 9.003  | 9 15   | Winter | 1             | +0%            | 100/15    | Summer               |           |           |               | 83.352      | -0.219           |
| 9.004  | 10 15  | Winter | 1             | +0%            | 30/15     | Summer               |           |           |               | 82.954      | -0.160           |
| 1.011  | 11 30  | Winter | 1             | +0%            | 30/15     | Summer               |           |           |               | 82.904      | 0.000            |
| 1.012  | 12 30  | Winter | 1             | +0%            | 100/30    | Winter               |           |           |               | 82.424      | -0.451           |
| 1.013  | 13 30  | Winter | 1             | +0%            | 100/15    | Summer               |           |           |               | 81.450      | -0.391           |
| 10.000 | 14A 15 | Winter | 1             | +0%            |           |                      |           |           |               | 84.153      | -0.197           |
| 10.001 | 14 15  | Winter | 1             | +0%            |           |                      |           |           |               | 82.717      | -0.178           |
| 1.014  | 15 30  | Winter | 1             | +0%            | 30/30     | Winter               |           |           |               | 81.128      | -0.353           |
| 1.015  | 16 30  | Winter | 1             | +0%            | 100/15    | Summer               |           |           |               | 80.847      | -0.386           |
| 11.000 | 17 15  | Winter | 1             | +0%            | 100/15    | Summer               |           |           |               | 83.759      | -0.151           |
| 12.000 | 101 15 | Winter | 1             | +0%            | 100/15    | Summer               |           |           |               | 93.916      | -0.134           |
| 12.001 | 102 15 | Winter | 1             | +0%            | 100/15    | Summer               |           |           |               | 93.277      | -0.125           |
| 12.002 | 103 15 | Winter | 1             | +0%            | 30/15     | Summer               |           |           |               | 90.876      | -0.063           |
| 12.003 | 104 15 | Winter | 1             | +0%            | 30/15     | Summer               |           |           |               | 90.517      | -0.157           |
| 12.004 | 105 15 | Winter | 1             | +0%            |           |                      |           |           |               | 90.276      | -0.205           |
| 12.005 | 106 15 | Winter | 1             | +0%            |           |                      |           |           |               | 89.360      | -0.205           |
| 13.000 | 107 15 | Winter | 1             | +0%            |           |                      |           |           |               | 96.639      | -0.172           |
| 13.001 | 108 15 | Winter | 1             | +0%            | 100/15    | Summer               |           |           |               | 95.368      | -0.157           |
| 13.002 | 109 15 | Winter | 1             | +0%            | 100/15    | Summer               |           |           |               | 94.278      | -0.146           |
| 13.003 | 110 15 | Winter | 1             | +0%            | 100/15    | Summer               |           |           |               | 93.017      | -0.175           |
| 13.004 | 111 15 | Winter | 1             | +0%            | 100/15    | Summer               |           |           |               | 92.868      | -0.182           |
| 14.000 | 112 15 | Winter | 1             | +0%            | 100/15    | Summer               |           |           |               | 93.673      | -0.163           |
| 14.001 | 113 15 | Winter | 1             | +0%            | 100/15    | Summer               |           |           |               | 93.133      | -0.127           |
| 14.002 | 114 15 | Winter | 1             | +0%            | 100/15    | Summer               |           |           |               | 93.019      | -0.136           |
| 13.005 | 115 15 | Winter | 1             | +0%            | 100/15    | Summer               |           |           |               | 92.674      | -0.193           |
| 13.006 | 116 15 | Winter | 1             | +0%            |           |                      |           |           |               | 91.746      | -0.335           |
| 13.007 | 117 15 | Winter | 1             | +0%            |           |                      |           |           |               | 90.923      | -0.323           |
| 13.008 | 118 15 | Winter | 1             | +0%            |           |                      |           |           |               | 90.530      | -0.347           |
| 13.009 | 119 15 | Winter | 1             | +0%            | 100/15    | Summer               |           |           |               | 88.509      | -0.291           |
| 12.006 | 120 15 | Winter | 1             | +0%            | 30/15     | Summer               |           |           |               | 87.049      | -0.101           |
| 12.007 | 121 15 | Winter | 1             | +0%            | 30/15     | Summer               |           |           |               | 85.209      | -0.102           |
| 12.008 | 122 15 | Winter | 1             | +0%            | 30/15     | Summer 100/15 Winter |           |           |               | 84.049      | 0.000            |
| 15.000 | 123 15 | Winter | 1             | +0%            |           |                      |           |           |               | 89.208      | -0.153           |
| 15.001 | 124 15 | Winter | 1             | +0%            |           |                      |           |           |               | 87.483      | -0.214           |
| 15.002 | 125 15 | Winter | 1             | +0%            | 100/15    | Winter               |           |           |               | 85.815      | -0.226           |
| 15.003 | 126 15 | Winter | 1             | +0%            | 100/15    | Summer               |           |           |               | 85.119      | -0.206           |
| 15.004 | 127 15 | Winter | 1             | +0%            | 100/15    | Summer               |           |           |               | 84.691      | -0.276           |

|                             |                     |                                                                                     |
|-----------------------------|---------------------|-------------------------------------------------------------------------------------|
| Coopers                     |                     | Page 22                                                                             |
| Park House                  | EDGEHILL PHASE 2    |  |
| Sandpiper Court             | CUMBRIA             |                                                                                     |
| Chester CH4 9QU             | SW Design           |                                                                                     |
| Date 01/05/2019             | Designed by Coopers |                                                                                     |
| File 7503 3A + Planning.MDX | Checked by          |                                                                                     |
| Micro Drainage              | Network 2018.1.1    |                                                                                     |

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Phase 2+3a  
new layout 21.3.5.SWS

| PN     | US/MH<br>Name | Flooded        |                | Pipe              |               | Status     | Level<br>Exceeded |
|--------|---------------|----------------|----------------|-------------------|---------------|------------|-------------------|
|        |               | Volume<br>(m³) | Flow /<br>Cap. | Overflow<br>(l/s) | Flow<br>(l/s) |            |                   |
| 4.007  | 214           | 0.000          | 0.88           |                   | 127.7         | OK         |                   |
| 4.008  | 215           | 0.000          | 1.01           |                   | 125.2         | SURCHARGED |                   |
| 8.000  | 216           | 0.000          | 0.20           |                   | 9.6           | OK         |                   |
| 8.001  | 217           | 0.000          | 0.08           |                   | 12.5          | OK         |                   |
| 8.002  | 218           | 0.000          | 0.19           |                   | 20.4          | OK         |                   |
| 8.003  | 219           | 0.000          | 0.21           |                   | 31.7          | OK         |                   |
| 4.009  | 220           | 0.000          | 1.15           |                   | 155.2         | SURCHARGED |                   |
| 4.010  | 221           | 0.000          | 1.28           |                   | 152.3         | SURCHARGED |                   |
| 4.011  | 222           | 0.000          | 1.04           |                   | 152.5         | SURCHARGED |                   |
| 4.012  | 223           | 0.000          | 1.15           |                   | 154.1         | SURCHARGED |                   |
| 4.013  | 224           | 0.000          | 0.38           |                   | 155.4         | OK         |                   |
| 4.014  | 225           | 0.000          | 0.46           |                   | 161.9         | OK         |                   |
| 4.015  | 226           | 0.000          | 1.01           |                   | 156.7         | OK         |                   |
| 4.016  | 227           | 0.000          | 0.62           |                   | 157.8         | OK         |                   |
| 3.006  | 234           | 0.000          | 0.38           |                   | 197.7         | OK         |                   |
| 1.010  | 5             | 0.000          | 0.22           |                   | 260.9         | OK         |                   |
| 9.000  | 6             | 0.000          | 0.13           |                   | 7.5           | OK         |                   |
| 9.001  | 7             | 0.000          | 0.14           |                   | 8.4           | OK         |                   |
| 9.002  | 8             | 0.000          | 0.21           |                   | 11.7          | OK         |                   |
| 9.003  | 9             | 0.000          | 0.16           |                   | 16.8          | OK         |                   |
| 9.004  | 10            | 0.000          | 0.44           |                   | 29.5          | OK         |                   |
| 1.011  | 11            | 0.000          | 1.12           |                   | 281.8         | OK         |                   |
| 1.012  | 12            | 0.000          | 0.24           |                   | 283.4         | OK         |                   |
| 1.013  | 13            | 0.000          | 0.37           |                   | 283.2         | OK         |                   |
| 10.000 | 14A           | 0.000          | 0.04           |                   | 4.6           | OK         |                   |
| 10.001 | 14            | 0.000          | 0.09           |                   | 10.3          | OK         |                   |
| 1.014  | 15            | 0.000          | 0.46           |                   | 287.8         | OK         |                   |
| 1.015  | 16            | 0.000          | 0.38           |                   | 291.5         | OK         |                   |
| 11.000 | 17            | 0.000          | 0.23           |                   | 8.0           | OK         |                   |
| 12.000 | 101           | 0.000          | 0.34           |                   | 20.0          | OK         |                   |
| 12.001 | 102           | 0.000          | 0.41           |                   | 27.3          | OK         |                   |
| 12.002 | 103           | 0.000          | 0.85           |                   | 32.4          | OK         |                   |
| 12.003 | 104           | 0.000          | 0.46           |                   | 37.7          | OK         |                   |
| 12.004 | 105           | 0.000          | 0.22           |                   | 44.3          | OK         |                   |
| 12.005 | 106           | 0.000          | 0.22           |                   | 50.6          | OK         |                   |
| 13.000 | 107           | 0.000          | 0.12           |                   | 10.7          | OK         |                   |
| 13.001 | 108           | 0.000          | 0.20           |                   | 17.1          | OK         |                   |
| 13.002 | 109           | 0.000          | 0.26           |                   | 24.6          | OK         |                   |
| 13.003 | 110           | 0.000          | 0.36           |                   | 28.9          | OK         |                   |
| 13.004 | 111           | 0.000          | 0.32           |                   | 32.3          | OK         |                   |
| 14.000 | 112           | 0.000          | 0.16           |                   | 10.8          | OK         |                   |
| 14.001 | 113           | 0.000          | 0.39           |                   | 14.6          | OK         |                   |
| 14.002 | 114           | 0.000          | 0.33           |                   | 19.4          | OK         |                   |
| 13.005 | 115           | 0.000          | 0.27           |                   | 51.4          | OK         |                   |
| 13.006 | 116           | 0.000          | 0.14           |                   | 59.8          | OK         |                   |
| 13.007 | 117           | 0.000          | 0.18           |                   | 60.2          | OK         |                   |
| 13.008 | 118           | 0.000          | 0.12           |                   | 65.0          | OK         |                   |
| 13.009 | 119           | 0.000          | 0.27           |                   | 72.6          | OK         |                   |
| 12.006 | 120           | 0.000          | 0.95           |                   | 124.8         | OK         |                   |
| 12.007 | 121           | 0.000          | 0.95           |                   | 135.6         | OK         |                   |
| 12.008 | 122           | 0.000          | 1.02           |                   | 142.8         | OK         | 3                 |
| 15.000 | 123           | 0.000          | 0.22           |                   | 17.8          | OK         |                   |
| 15.001 | 124           | 0.000          | 0.18           |                   | 24.7          | OK         |                   |
| 15.002 | 125           | 0.000          | 0.14           |                   | 24.8          | OK         |                   |
| 15.003 | 126           | 0.000          | 0.22           |                   | 32.7          | OK         |                   |

|                                                  |                                          |                                                                                     |
|--------------------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------|
| Coopers                                          |                                          | Page 23                                                                             |
| Park House<br>Sandpiper Court<br>Chester CH4 9QU | EDGEHILL PHASE 2<br>CUMBRIA<br>SW Design |  |
| Date 01/05/2019<br>File 7503 3A + Planning.MDX   | Designed by Coopers<br>Checked by        |                                                                                     |
| Micro Drainage                                   | Network 2018.1.1                         |                                                                                     |

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Phase 2+3a  
new layout 21.3.5.SWS

| PN     | US/MH<br>Name | Flooded        |                               | Pipe          | Status | Level<br>Exceeded |
|--------|---------------|----------------|-------------------------------|---------------|--------|-------------------|
|        |               | Volume<br>(m³) | Flow / Overflow<br>Cap. (l/s) | Flow<br>(l/s) |        |                   |
| 15.004 | 127           | 0.000          | 0.28                          | 31.9          | OK     |                   |

|                                                  |                                          |                                                                                     |
|--------------------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------|
| Coopers                                          |                                          | Page 24                                                                             |
| Park House<br>Sandpiper Court<br>Chester CH4 9QU | EDGEHILL PHASE 2<br>CUMBRIA<br>SW Design |  |
| Date 01/05/2019<br>File 7503 3A + Planning.MDX   | Designed by Coopers<br>Checked by        |                                                                                     |
| Micro Drainage                                   |                                          | Network 2018.1.1                                                                    |

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Phase 2+3a  
new layout 21.3.5.SWS

| PN     | US/MH |            | Return Period | Climate Change | First (X)<br>Surcharge | First (Y)<br>Flood | First (Z)<br>Overflow | Overflow<br>Act. | Water Level | Surcharged<br>Depth |
|--------|-------|------------|---------------|----------------|------------------------|--------------------|-----------------------|------------------|-------------|---------------------|
|        | Name  | Storm      |               |                |                        |                    |                       |                  | (m)         | (m)                 |
| 15.005 | 128   | 15 Winter  | 1             | +0%            | 100/15 Summer          |                    |                       |                  | 84.648      | -0.278              |
| 12.009 | 129   | 15 Winter  | 1             | +0%            | 30/15 Summer           |                    |                       |                  | 83.854      | -0.109              |
| 11.001 | 18    | 15 Winter  | 1             | +0%            | 100/15 Summer          |                    |                       |                  | 83.571      | -0.263              |
| 11.002 | 19    | 15 Winter  | 1             | +0%            | 100/15 Summer          |                    |                       |                  | 81.664      | -0.271              |
| 1.016  | 20    | 30 Winter  | 1             | +0%            | 100/15 Summer          |                    |                       |                  | 78.256      | -0.429              |
| 1.017  | 21    | 30 Winter  | 1             | +0%            | 30/15 Winter           |                    |                       |                  | 76.200      | -0.401              |
| 16.000 | 22A   | 15 Winter  | 1             | +0%            |                        |                    |                       |                  | 78.371      | -0.179              |
| 16.001 | 22B   | 15 Winter  | 1             | +0%            |                        |                    |                       |                  | 78.230      | -0.191              |
| 16.002 | 22    | 15 Winter  | 1             | +0%            |                        |                    |                       |                  | 76.599      | -0.171              |
| 1.018  | 23    | 15 Winter  | 1             | +0%            | 30/15 Winter           |                    |                       |                  | 73.539      | -0.402              |
| 17.000 | 24A   | 15 Winter  | 1             | +0%            | 100/15 Summer          |                    |                       |                  | 72.785      | -0.165              |
| 17.001 | 24B   | 15 Winter  | 1             | +0%            | 100/15 Summer          |                    |                       |                  | 72.692      | -0.146              |
| 17.002 | 24C   | 15 Winter  | 1             | +0%            | 100/15 Summer          |                    |                       |                  | 72.479      | -0.151              |
| 1.019  | 24    | 15 Winter  | 1             | +0%            | 30/15 Summer           |                    |                       |                  | 71.208      | -0.304              |
| 1.020  | 25    | 15 Winter  | 1             | +0%            | 100/15 Summer          |                    |                       |                  | 68.870      | -0.442              |
| 1.021  | 26    | 30 Winter  | 1             | +0%            | 100/15 Summer          |                    |                       |                  | 65.884      | -0.471              |
| 1.022  | 27    | 30 Winter  | 1             | +0%            | 100/15 Summer          |                    |                       |                  | 64.524      | -0.411              |
| 1.023  | 28    | 720 Winter | 1             | +0%            | 30/180 Winter          |                    |                       |                  | 63.267      | -0.171              |
| 1.024  | 29    | 720 Winter | 1             | +0%            |                        |                    |                       |                  | 59.639      | -0.281              |

| PN     | US/MH<br>Name | Flooded        |                | Pipe          |        | Level<br>Exceeded |
|--------|---------------|----------------|----------------|---------------|--------|-------------------|
|        |               | Volume<br>(m³) | Flow /<br>Cap. | Flow<br>(l/s) | Status |                   |
| 15.005 | 128           | 0.000          | 0.31           | 32.8          | OK     |                   |
| 12.009 | 129           | 0.000          | 0.93           | 176.3         | OK     |                   |
| 11.001 | 18            | 0.000          | 0.36           | 179.7         | OK     |                   |
| 11.002 | 19            | 0.000          | 0.33           | 179.0         | OK     |                   |
| 1.016  | 20            | 0.000          | 0.38           | 442.2         | OK     |                   |
| 1.017  | 21            | 0.000          | 0.44           | 443.0         | OK     |                   |
| 16.000 | 22A           | 0.000          | 0.09           | 3.3           | OK     |                   |
| 16.001 | 22B           | 0.000          | 0.05           | 7.4           | OK     |                   |
| 16.002 | 22            | 0.000          | 0.13           | 17.9          | OK     |                   |
| 1.018  | 23            | 0.000          | 0.44           | 449.4         | OK     |                   |
| 17.000 | 24A           | 0.000          | 0.16           | 5.5           | OK     |                   |
| 17.001 | 24B           | 0.000          | 0.26           | 9.8           | OK     |                   |
| 17.002 | 24C           | 0.000          | 0.24           | 13.2          | OK     |                   |
| 1.019  | 24            | 0.000          | 0.66           | 459.4         | OK     |                   |
| 1.020  | 25            | 0.000          | 0.35           | 460.6         | OK     |                   |
| 1.021  | 26            | 0.000          | 0.30           | 460.7         | OK     |                   |
| 1.022  | 27            | 0.000          | 0.42           | 460.8         | OK     |                   |
| 1.023  | 28            | 0.000          | 0.12           | 70.7          | OK     |                   |
| 1.024  | 29            | 0.000          | 0.30           | 70.7          | OK     |                   |

|                                                  |                                          |                                                                                     |
|--------------------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------|
| Coopers                                          |                                          | Page 25                                                                             |
| Park House<br>Sandpiper Court<br>Chester CH4 9QU | EDGEHILL PHASE 2<br>CUMBRIA<br>SW Design |  |
| Date 01/05/2019                                  | Designed by Coopers                      |                                                                                     |
| File 7503 3A + Planning.MDX                      | Checked by                               |                                                                                     |
| Micro Drainage                                   | Network 2018.1.1                         |                                                                                     |

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Phase 2+3a  
new layout 21.3.5.SWS

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000  
Hot Start (mins) 0 MADD Factor \* 10m<sup>3</sup>/ha Storage 2.000  
Hot Start Level (mm) 0 Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0  
Number of Online Controls 1 Number of Storage Structures 4 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 16.000 Cv (Summer) 0.750  
Region England and Wales Ratio R 0.267 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON  
Analysis Timestep Fine Inertia Status ON  
DTS Status OFF

Profile(s) Summer and Winter  
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960,  
1440, 2160, 2880  
Return Period(s) (years) 1, 30, 100  
Climate Change (%) 0, 0, 40

| US/MH |               | Storm | Return Period | Climate Change | First (X) Surchage | First (Y) Flood | First (Z) Overflow | Overflow Act. | Water Level | Surcharged Depth |
|-------|---------------|-------|---------------|----------------|--------------------|-----------------|--------------------|---------------|-------------|------------------|
| PN    | Name          |       |               |                |                    |                 |                    |               | (m)         | (m)              |
| 1.000 | 301 15 Winter |       | 30            | +0%            | 30/15 Summer       | 100/15 Winter   |                    |               | 91.389      | 0.244            |
| 1.001 | 302 15 Winter |       | 30            | +0%            | 30/15 Summer       |                 |                    |               | 91.363      | 0.376            |
| 1.002 | 303 15 Winter |       | 30            | +0%            | 30/15 Summer       |                 |                    |               | 90.907      | 0.235            |
| 1.003 | 304 15 Winter |       | 30            | +0%            | 100/15 Summer      |                 |                    |               | 90.341      | -0.159           |
| 1.004 | 305 15 Winter |       | 30            | +0%            | 100/15 Summer      |                 |                    |               | 89.706      | -0.129           |
| 1.005 | 306 15 Winter |       | 30            | +0%            | 100/15 Summer      |                 |                    |               | 89.370      | -0.127           |
| 1.006 | 307 15 Winter |       | 30            | +0%            | 30/15 Summer       |                 |                    |               | 89.104      | 0.172            |
| 1.007 | 308 15 Winter |       | 30            | +0%            | 30/15 Winter       |                 |                    |               | 88.871      | 0.074            |
| 1.008 | 1 15 Winter   |       | 30            | +0%            | 30/15 Summer       |                 |                    |               | 88.493      | 0.817            |
| 2.000 | 2 15 Winter   |       | 30            | +0%            | 30/15 Summer       |                 |                    |               | 88.020      | 0.553            |
| 1.009 | 3 15 Winter   |       | 30            | +0%            | 30/15 Summer       |                 |                    |               | 88.022      | 0.996            |
| 3.000 | 228 15 Winter |       | 30            | +0%            | 100/15 Summer      |                 |                    |               | 92.425      | -0.128           |
| 3.001 | 229 15 Winter |       | 30            | +0%            | 100/15 Summer      |                 |                    |               | 91.532      | -0.076           |
| 3.002 | 230 15 Winter |       | 30            | +0%            | 30/15 Summer       |                 |                    |               | 91.396      | 0.045            |
| 3.003 | 231 15 Winter |       | 30            | +0%            | 100/15 Summer      |                 |                    |               | 88.664      | -0.105           |
| 3.004 | 232 15 Winter |       | 30            | +0%            | 100/15 Summer      |                 |                    |               | 88.595      | -0.103           |
| 3.005 | 233 15 Winter |       | 30            | +0%            | 100/15 Summer      |                 |                    |               | 88.540      | -0.109           |
| 4.000 | 201 15 Winter |       | 30            | +0%            |                    |                 |                    |               | 93.562      | -0.163           |
| 4.001 | 202 15 Winter |       | 30            | +0%            |                    |                 |                    |               | 92.666      | -0.163           |
| 4.002 | 203 15 Winter |       | 30            | +0%            | 100/15 Summer      |                 |                    |               | 91.149      | -0.301           |
| 4.003 | 204 30 Winter |       | 30            | +0%            | 100/15 Summer      |                 |                    |               | 91.108      | -0.202           |
| 4.004 | 205 30 Winter |       | 30            | +0%            | 30/15 Summer       |                 |                    |               | 91.082      | 0.291            |
| 4.005 | 206 30 Winter |       | 30            | +0%            | 30/15 Summer       |                 |                    |               | 90.981      | 0.448            |
| 5.000 | 207 15 Winter |       | 30            | +0%            | 100/15 Winter      |                 |                    |               | 92.047      | -0.113           |
| 6.000 | 208 15 Winter |       | 30            | +0%            |                    |                 |                    |               | 92.616      | -0.125           |
| 6.001 | 209 15 Winter |       | 30            | +0%            | 100/15 Summer      |                 |                    |               | 91.609      | -0.166           |
| 6.002 | 210 15 Winter |       | 30            | +0%            | 100/15 Summer      |                 |                    |               | 91.386      | -0.127           |
| 5.001 | 211 15 Winter |       | 30            | +0%            | 30/15 Winter       |                 |                    |               | 91.010      | 0.031            |
| 4.006 | 212 15 Winter |       | 30            | +0%            | 30/15 Summer       | 100/30 Winter   |                    |               | 90.817      | 0.665            |
| 7.000 | 213 15 Winter |       | 30            | +0%            | 100/15 Summer      |                 |                    |               | 90.854      | -0.146           |

|                             |                     |                                                                                     |
|-----------------------------|---------------------|-------------------------------------------------------------------------------------|
| Coopers                     |                     | Page 26                                                                             |
| Park House                  | EDGEHILL PHASE 2    |  |
| Sandpiper Court             | CUMBRIA             |                                                                                     |
| Chester CH4 9QU             | SW Design           |                                                                                     |
| Date 01/05/2019             | Designed by Coopers |                                                                                     |
| File 7503 3A + Planning.MDX | Checked by          |                                                                                     |
| Micro Drainage              | Network 2018.1.1    |                                                                                     |

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Phase 2+3a  
new layout 21.3.5.SWS

| PN    | US/MH<br>Name | Flooded        |                | Pipe              |               | Status     | Level<br>Exceeded |
|-------|---------------|----------------|----------------|-------------------|---------------|------------|-------------------|
|       |               | Volume<br>(m³) | Flow /<br>Cap. | Overflow<br>(l/s) | Flow<br>(l/s) |            |                   |
| 1.000 | 301           | 0.000          | 0.36           |                   | 18.9          | SURCHARGED | 1                 |
| 1.001 | 302           | 0.000          | 1.18           |                   | 47.8          | SURCHARGED |                   |
| 1.002 | 303           | 0.000          | 1.54           |                   | 60.3          | SURCHARGED |                   |
| 1.003 | 304           | 0.000          | 0.44           |                   | 68.0          | OK         |                   |
| 1.004 | 305           | 0.000          | 0.60           |                   | 79.1          | OK         |                   |
| 1.005 | 306           | 0.000          | 0.62           |                   | 96.5          | OK         |                   |
| 1.006 | 307           | 0.000          | 1.50           |                   | 118.7         | SURCHARGED |                   |
| 1.007 | 308           | 0.000          | 0.66           |                   | 134.8         | SURCHARGED |                   |
| 1.008 | 1             | 0.000          | 0.86           |                   | 129.6         | SURCHARGED |                   |
| 2.000 | 2             | 0.000          | 0.06           |                   | 5.1           | SURCHARGED |                   |
| 1.009 | 3             | 0.000          | 1.54           |                   | 140.5         | SURCHARGED |                   |
| 3.000 | 228           | 0.000          | 0.37           |                   | 23.9          | OK         |                   |
| 3.001 | 229           | 0.000          | 0.77           |                   | 61.4          | OK         |                   |
| 3.002 | 230           | 0.000          | 1.08           |                   | 87.3          | SURCHARGED |                   |
| 3.003 | 231           | 0.000          | 0.79           |                   | 108.5         | OK         |                   |
| 3.004 | 232           | 0.000          | 0.89           |                   | 113.9         | OK         |                   |
| 3.005 | 233           | 0.000          | 0.92           |                   | 116.6         | OK         |                   |
| 4.000 | 201           | 0.000          | 0.17           |                   | 16.6          | OK         |                   |
| 4.001 | 202           | 0.000          | 0.17           |                   | 16.4          | OK         |                   |
| 4.002 | 203           | 0.000          | 0.24           |                   | 50.3          | OK         |                   |
| 4.003 | 204           | 0.000          | 0.17           |                   | 65.7          | OK         |                   |
| 4.004 | 205           | 0.000          | 0.31           |                   | 69.0          | SURCHARGED |                   |
| 4.005 | 206           | 0.000          | 0.28           |                   | 78.5          | SURCHARGED |                   |
| 5.000 | 207           | 0.000          | 0.49           |                   | 43.7          | OK         |                   |
| 6.000 | 208           | 0.000          | 0.40           |                   | 30.9          | OK         |                   |
| 6.001 | 209           | 0.000          | 0.40           |                   | 43.7          | OK         |                   |
| 6.002 | 210           | 0.000          | 0.61           |                   | 67.6          | OK         |                   |
| 5.001 | 211           | 0.000          | 0.42           |                   | 153.2         | SURCHARGED |                   |
| 4.006 | 212           | 0.000          | 0.89           |                   | 185.5         | SURCHARGED | 1                 |
| 7.000 | 213           | 0.000          | 0.26           |                   | 35.1          | OK         |                   |

|                             |                     |                                                                                     |
|-----------------------------|---------------------|-------------------------------------------------------------------------------------|
| Coopers                     |                     | Page 27                                                                             |
| Park House                  | EDGEHILL PHASE 2    |  |
| Sandpiper Court             | CUMBRIA             |                                                                                     |
| Chester CH4 9QU             | SW Design           |                                                                                     |
| Date 01/05/2019             | Designed by Coopers |                                                                                     |
| File 7503 3A + Planning.MDX | Checked by          |                                                                                     |
| Micro Drainage              | Network 2018.1.1    |                                                                                     |

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Phase 2+3a  
new layout 21.3.5.SWS

| PN     | US/MH |           | Return Period | Climate Change | First (X)                  |       | First (Y) | First (Z) | Overflow Act. | Water Level | Surcharged Depth |
|--------|-------|-----------|---------------|----------------|----------------------------|-------|-----------|-----------|---------------|-------------|------------------|
|        | Name  | Storm     |               |                | Surcharge                  | Flood |           |           |               | (m)         | (m)              |
| 4.007  | 214   | 15 Winter | 30            | +0%            | 30/15 Summer               |       |           |           |               | 90.706      | 1.133            |
| 4.008  | 215   | 30 Winter | 30            | +0%            | 1/15 Summer                |       |           |           |               | 90.496      | 1.040            |
| 8.000  | 216   | 15 Winter | 30            | +0%            | 100/30 Winter              |       |           |           |               | 91.586      | -0.114           |
| 8.001  | 217   | 15 Winter | 30            | +0%            | 100/30 Summer              |       |           |           |               | 91.371      | -0.209           |
| 8.002  | 218   | 30 Winter | 30            | +0%            | 100/15 Summer              |       |           |           |               | 90.566      | -0.104           |
| 8.003  | 219   | 30 Winter | 30            | +0%            | 30/15 Summer               |       |           |           |               | 90.522      | 0.357            |
| 4.009  | 220   | 30 Winter | 30            | +0%            | 1/15 Summer                |       |           |           |               | 90.373      | 0.964            |
| 4.010  | 221   | 30 Winter | 30            | +0%            | 1/15 Winter                |       |           |           |               | 90.136      | 0.791            |
| 4.011  | 222   | 30 Winter | 30            | +0%            | 1/15 Winter                |       |           |           |               | 89.917      | 0.616            |
| 4.012  | 223   | 30 Winter | 30            | +0%            | 1/15 Winter                |       |           |           |               | 89.378      | 0.214            |
| 4.013  | 224   | 30 Winter | 30            | +0%            | 100/15 Summer              |       |           |           |               | 89.007      | -0.097           |
| 4.014  | 225   | 30 Winter | 30            | +0%            | 30/15 Summer               |       |           |           |               | 88.479      | 0.344            |
| 4.015  | 226   | 30 Winter | 30            | +0%            | 30/15 Summer               |       |           |           |               | 88.171      | 0.427            |
| 4.016  | 227   | 30 Winter | 30            | +0%            | 30/15 Summer               |       |           |           |               | 87.846      | 0.173            |
| 3.006  | 234   | 30 Winter | 30            | +0%            | 100/15 Summer              |       |           |           |               | 87.241      | -0.130           |
| 1.010  | 5     | 30 Winter | 30            | +0%            |                            |       |           |           |               | 83.851      | -0.343           |
| 9.000  | 6     | 15 Winter | 30            | +0%            |                            |       |           |           |               | 84.453      | -0.137           |
| 9.001  | 7     | 15 Winter | 30            | +0%            | 100/15 Winter              |       |           |           |               | 84.155      | -0.131           |
| 9.002  | 8     | 15 Winter | 30            | +0%            | 100/15 Summer              |       |           |           |               | 83.804      | -0.106           |
| 9.003  | 9     | 15 Winter | 30            | +0%            | 100/15 Summer              |       |           |           |               | 83.413      | -0.158           |
| 9.004  | 10    | 30 Summer | 30            | +0%            | 30/15 Summer               |       |           |           |               | 83.249      | 0.135            |
| 1.011  | 11    | 30 Winter | 30            | +0%            | 30/15 Summer               |       |           |           |               | 83.106      | 0.202            |
| 1.012  | 12    | 30 Winter | 30            | +0%            | 100/30 Winter              |       |           |           |               | 82.556      | -0.319           |
| 1.013  | 13    | 30 Winter | 30            | +0%            | 100/15 Summer              |       |           |           |               | 81.752      | -0.089           |
| 10.000 | 14A   | 15 Winter | 30            | +0%            |                            |       |           |           |               | 84.171      | -0.179           |
| 10.001 | 14    | 15 Winter | 30            | +0%            |                            |       |           |           |               | 82.748      | -0.147           |
| 1.014  | 15    | 30 Winter | 30            | +0%            | 30/30 Winter               |       |           |           |               | 81.482      | 0.001            |
| 1.015  | 16    | 30 Winter | 30            | +0%            | 100/15 Summer              |       |           |           |               | 81.048      | -0.185           |
| 11.000 | 17    | 15 Winter | 30            | +0%            | 100/15 Summer              |       |           |           |               | 83.807      | -0.103           |
| 12.000 | 101   | 15 Winter | 30            | +0%            | 100/15 Summer              |       |           |           |               | 93.983      | -0.067           |
| 12.001 | 102   | 15 Winter | 30            | +0%            | 100/15 Summer              |       |           |           |               | 93.386      | -0.016           |
| 12.002 | 103   | 15 Winter | 30            | +0%            | 30/15 Summer               |       |           |           |               | 91.873      | 0.934            |
| 12.003 | 104   | 15 Winter | 30            | +0%            | 30/15 Summer               |       |           |           |               | 90.698      | 0.024            |
| 12.004 | 105   | 15 Winter | 30            | +0%            |                            |       |           |           |               | 90.334      | -0.147           |
| 12.005 | 106   | 15 Winter | 30            | +0%            |                            |       |           |           |               | 89.420      | -0.145           |
| 13.000 | 107   | 15 Winter | 30            | +0%            |                            |       |           |           |               | 96.670      | -0.141           |
| 13.001 | 108   | 15 Winter | 30            | +0%            | 100/15 Summer              |       |           |           |               | 95.416      | -0.109           |
| 13.002 | 109   | 15 Winter | 30            | +0%            | 100/15 Summer              |       |           |           |               | 94.343      | -0.081           |
| 13.003 | 110   | 15 Winter | 30            | +0%            | 100/15 Summer              |       |           |           |               | 93.145      | -0.047           |
| 13.004 | 111   | 15 Winter | 30            | +0%            | 100/15 Summer              |       |           |           |               | 92.973      | -0.077           |
| 14.000 | 112   | 15 Winter | 30            | +0%            | 100/15 Summer              |       |           |           |               | 93.711      | -0.125           |
| 14.001 | 113   | 15 Winter | 30            | +0%            | 100/15 Summer              |       |           |           |               | 93.217      | -0.043           |
| 14.002 | 114   | 15 Winter | 30            | +0%            | 100/15 Summer              |       |           |           |               | 93.093      | -0.062           |
| 13.005 | 115   | 15 Winter | 30            | +0%            | 100/15 Summer              |       |           |           |               | 92.763      | -0.104           |
| 13.006 | 116   | 15 Winter | 30            | +0%            |                            |       |           |           |               | 91.830      | -0.251           |
| 13.007 | 117   | 15 Winter | 30            | +0%            |                            |       |           |           |               | 91.017      | -0.229           |
| 13.008 | 118   | 15 Winter | 30            | +0%            |                            |       |           |           |               | 90.602      | -0.275           |
| 13.009 | 119   | 15 Winter | 30            | +0%            | 100/15 Summer              |       |           |           |               | 88.642      | -0.158           |
| 12.006 | 120   | 15 Winter | 30            | +0%            | 30/15 Summer               |       |           |           |               | 87.414      | 0.264            |
| 12.007 | 121   | 15 Winter | 30            | +0%            | 30/15 Summer               |       |           |           |               | 85.760      | 0.449            |
| 12.008 | 122   | 15 Winter | 30            | +0%            | 30/15 Summer 100/15 Winter |       |           |           |               | 85.062      | 1.013            |
| 15.000 | 123   | 15 Winter | 30            | +0%            |                            |       |           |           |               | 89.253      | -0.108           |
| 15.001 | 124   | 15 Winter | 30            | +0%            |                            |       |           |           |               | 87.541      | -0.156           |
| 15.002 | 125   | 15 Winter | 30            | +0%            | 100/15 Winter              |       |           |           |               | 85.864      | -0.177           |
| 15.003 | 126   | 15 Winter | 30            | +0%            | 100/15 Summer              |       |           |           |               | 85.190      | -0.135           |
| 15.004 | 127   | 15 Winter | 30            | +0%            | 100/15 Summer              |       |           |           |               | 84.828      | -0.139           |

|                             |                     |                                                                                     |
|-----------------------------|---------------------|-------------------------------------------------------------------------------------|
| Coopers                     |                     | Page 28                                                                             |
| Park House                  | EDGEHILL PHASE 2    |  |
| Sandpiper Court             | CUMBRIA             |                                                                                     |
| Chester CH4 9QU             | SW Design           |                                                                                     |
| Date 01/05/2019             | Designed by Coopers |                                                                                     |
| File 7503 3A + Planning.MDX | Checked by          |                                                                                     |
| Micro Drainage              | Network 2018.1.1    |                                                                                     |

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Phase 2+3a  
new layout 21.3.5.SWS

| PN     | US/MH<br>Name | Flooded        |                | Pipe              |               | Status     | Level<br>Exceeded |
|--------|---------------|----------------|----------------|-------------------|---------------|------------|-------------------|
|        |               | Volume<br>(m³) | Flow /<br>Cap. | Overflow<br>(l/s) | Flow<br>(l/s) |            |                   |
| 4.007  | 214           | 0.000          | 1.36           |                   | 197.1         | SURCHARGED |                   |
| 4.008  | 215           | 0.000          | 1.59           |                   | 197.7         | SURCHARGED |                   |
| 8.000  | 216           | 0.000          | 0.48           |                   | 23.1          | OK         |                   |
| 8.001  | 217           | 0.000          | 0.20           |                   | 31.8          | OK         |                   |
| 8.002  | 218           | 0.000          | 0.42           |                   | 45.6          | OK         |                   |
| 8.003  | 219           | 0.000          | 0.42           |                   | 64.0          | SURCHARGED |                   |
| 4.009  | 220           | 0.000          | 1.92           |                   | 259.2         | SURCHARGED |                   |
| 4.010  | 221           | 0.000          | 2.21           |                   | 264.2         | SURCHARGED |                   |
| 4.011  | 222           | 0.000          | 1.96           |                   | 288.8         | SURCHARGED |                   |
| 4.012  | 223           | 0.000          | 2.22           |                   | 296.6         | SURCHARGED |                   |
| 4.013  | 224           | 0.000          | 0.74           |                   | 299.5         | OK         |                   |
| 4.014  | 225           | 0.000          | 0.89           |                   | 313.3         | SURCHARGED |                   |
| 4.015  | 226           | 0.000          | 2.06           |                   | 321.0         | SURCHARGED |                   |
| 4.016  | 227           | 0.000          | 1.28           |                   | 325.0         | SURCHARGED |                   |
| 3.006  | 234           | 0.000          | 0.85           |                   | 437.6         | OK         |                   |
| 1.010  | 5             | 0.000          | 0.49           |                   | 582.5         | OK         |                   |
| 9.000  | 6             | 0.000          | 0.32           |                   | 18.0          | OK         |                   |
| 9.001  | 7             | 0.000          | 0.35           |                   | 20.6          | OK         |                   |
| 9.002  | 8             | 0.000          | 0.53           |                   | 29.8          | OK         |                   |
| 9.003  | 9             | 0.000          | 0.44           |                   | 45.4          | OK         |                   |
| 9.004  | 10            | 0.000          | 0.96           |                   | 64.9          | SURCHARGED |                   |
| 1.011  | 11            | 0.000          | 2.59           |                   | 651.7         | SURCHARGED |                   |
| 1.012  | 12            | 0.000          | 0.55           |                   | 651.8         | OK         |                   |
| 1.013  | 13            | 0.000          | 0.86           |                   | 651.6         | OK         |                   |
| 10.000 | 14A           | 0.000          | 0.09           |                   | 11.0          | OK         |                   |
| 10.001 | 14            | 0.000          | 0.26           |                   | 28.5          | OK         |                   |
| 1.014  | 15            | 0.000          | 1.06           |                   | 668.4         | SURCHARGED |                   |
| 1.015  | 16            | 0.000          | 0.86           |                   | 669.0         | OK         |                   |
| 11.000 | 17            | 0.000          | 0.56           |                   | 19.3          | OK         |                   |
| 12.000 | 101           | 0.000          | 0.81           |                   | 48.1          | OK         |                   |
| 12.001 | 102           | 0.000          | 1.00           |                   | 66.7          | OK         |                   |
| 12.002 | 103           | 0.000          | 2.07           |                   | 79.0          | SURCHARGED |                   |
| 12.003 | 104           | 0.000          | 1.08           |                   | 88.9          | SURCHARGED |                   |
| 12.004 | 105           | 0.000          | 0.51           |                   | 101.3         | OK         |                   |
| 12.005 | 106           | 0.000          | 0.52           |                   | 120.4         | OK         |                   |
| 13.000 | 107           | 0.000          | 0.29           |                   | 25.7          | OK         |                   |
| 13.001 | 108           | 0.000          | 0.52           |                   | 44.6          | OK         |                   |
| 13.002 | 109           | 0.000          | 0.72           |                   | 66.6          | OK         |                   |
| 13.003 | 110           | 0.000          | 0.99           |                   | 78.7          | OK         |                   |
| 13.004 | 111           | 0.000          | 0.90           |                   | 89.9          | OK         |                   |
| 14.000 | 112           | 0.000          | 0.40           |                   | 26.1          | OK         |                   |
| 14.001 | 113           | 0.000          | 0.97           |                   | 36.4          | OK         |                   |
| 14.002 | 114           | 0.000          | 0.85           |                   | 50.4          | OK         |                   |
| 13.005 | 115           | 0.000          | 0.75           |                   | 141.0         | OK         |                   |
| 13.006 | 116           | 0.000          | 0.40           |                   | 164.9         | OK         |                   |
| 13.007 | 117           | 0.000          | 0.48           |                   | 164.9         | OK         |                   |
| 13.008 | 118           | 0.000          | 0.32           |                   | 178.0         | OK         |                   |
| 13.009 | 119           | 0.000          | 0.74           |                   | 198.9         | OK         |                   |
| 12.006 | 120           | 0.000          | 2.47           |                   | 323.0         | SURCHARGED |                   |
| 12.007 | 121           | 0.000          | 2.45           |                   | 349.5         | SURCHARGED |                   |
| 12.008 | 122           | 0.000          | 2.53           |                   | 352.9         | SURCHARGED | 3                 |
| 15.000 | 123           | 0.000          | 0.52           |                   | 42.5          | OK         |                   |
| 15.001 | 124           | 0.000          | 0.45           |                   | 61.7          | OK         |                   |
| 15.002 | 125           | 0.000          | 0.34           |                   | 61.5          | OK         |                   |
| 15.003 | 126           | 0.000          | 0.56           |                   | 84.6          | OK         |                   |

|                                                  |                                          |                                                                                     |
|--------------------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------|
| Coopers                                          |                                          | Page 29                                                                             |
| Park House<br>Sandpiper Court<br>Chester CH4 9QU | EDGEHILL PHASE 2<br>CUMBRIA<br>SW Design |  |
| Date 01/05/2019<br>File 7503 3A + Planning.MDX   | Designed by Coopers<br>Checked by        |                                                                                     |
| Micro Drainage                                   | Network 2018.1.1                         |                                                                                     |

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Phase 2+3a  
new layout 21.3.5.SWS

|           |                       | <b>Flooded</b>                    |                        | <b>Pipe</b>           |               |                           |
|-----------|-----------------------|-----------------------------------|------------------------|-----------------------|---------------|---------------------------|
| <b>PN</b> | <b>US/MH<br/>Name</b> | <b>Volume<br/>(m<sup>3</sup>)</b> | <b>Flow /<br/>Cap.</b> | <b>Flow<br/>(l/s)</b> | <b>Status</b> | <b>Level<br/>Exceeded</b> |
| 15.004    | 127                   | 0.000                             | 0.74                   | 84.2                  | OK            |                           |

|                             |                     |                                                                                     |
|-----------------------------|---------------------|-------------------------------------------------------------------------------------|
| Coopers                     |                     | Page 30                                                                             |
| Park House                  | EDGEHILL PHASE 2    |  |
| Sandpiper Court             | CUMBRIA             |                                                                                     |
| Chester CH4 9QU             | SW Design           |                                                                                     |
| Date 01/05/2019             | Designed by Coopers |                                                                                     |
| File 7503 3A + Planning.MDX | Checked by          |                                                                                     |
| Micro Drainage              | Network 2018.1.1    |                                                                                     |

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Phase 2+3a  
new layout 21.3.5.SWS

| PN     | US/MH<br>Name | Storm      | Return<br>Period | Climate<br>Change | First (X)<br>Surcharge | First (Y)<br>Flood | First (Z)<br>Overflow | Overflow<br>Act. | Water Level<br>(m) | Surcharged<br>Depth<br>(m) |
|--------|---------------|------------|------------------|-------------------|------------------------|--------------------|-----------------------|------------------|--------------------|----------------------------|
| 15.005 | 128           | 15 Winter  | 30               | +0%               | 100/15 Summer          |                    |                       |                  | 84.787             | -0.139                     |
| 12.009 | 129           | 15 Winter  | 30               | +0%               | 30/15 Summer           |                    |                       |                  | 84.499             | 0.536                      |
| 11.001 | 18            | 15 Winter  | 30               | +0%               | 100/15 Summer          |                    |                       |                  | 83.718             | -0.116                     |
| 11.002 | 19            | 15 Winter  | 30               | +0%               | 100/15 Summer          |                    |                       |                  | 81.799             | -0.136                     |
| 1.016  | 20            | 15 Winter  | 30               | +0%               | 100/15 Summer          |                    |                       |                  | 78.497             | -0.188                     |
| 1.017  | 21            | 30 Winter  | 30               | +0%               | 30/15 Winter           |                    |                       |                  | 76.629             | 0.028                      |
| 16.000 | 22A           | 15 Winter  | 30               | +0%               |                        |                    |                       |                  | 78.398             | -0.152                     |
| 16.001 | 22B           | 15 Winter  | 30               | +0%               |                        |                    |                       |                  | 78.253             | -0.168                     |
| 16.002 | 22            | 15 Winter  | 30               | +0%               |                        |                    |                       |                  | 76.641             | -0.129                     |
| 1.018  | 23            | 30 Summer  | 30               | +0%               | 30/15 Winter           |                    |                       |                  | 73.973             | 0.032                      |
| 17.000 | 24A           | 15 Winter  | 30               | +0%               | 100/15 Summer          |                    |                       |                  | 72.822             | -0.128                     |
| 17.001 | 24B           | 15 Winter  | 30               | +0%               | 100/15 Summer          |                    |                       |                  | 72.753             | -0.085                     |
| 17.002 | 24C           | 15 Winter  | 30               | +0%               | 100/15 Summer          |                    |                       |                  | 72.538             | -0.092                     |
| 1.019  | 24            | 30 Winter  | 30               | +0%               | 30/15 Summer           |                    |                       |                  | 71.802             | 0.290                      |
| 1.020  | 25            | 30 Winter  | 30               | +0%               | 100/15 Summer          |                    |                       |                  | 69.102             | -0.210                     |
| 1.021  | 26            | 30 Winter  | 30               | +0%               | 100/15 Summer          |                    |                       |                  | 66.077             | -0.278                     |
| 1.022  | 27            | 30 Winter  | 30               | +0%               | 100/15 Summer          |                    |                       |                  | 64.897             | -0.038                     |
| 1.023  | 28            | 480 Winter | 30               | +0%               | 30/180 Winter          |                    |                       |                  | 63.501             | 0.063                      |
| 1.024  | 29            | 480 Winter | 30               | +0%               |                        |                    |                       |                  | 59.691             | -0.229                     |

| PN     | US/MH<br>Name | Flooded<br>Volume<br>(m³) | Flow /<br>Cap. | Overflow<br>(l/s) | Pipe<br>Flow<br>(l/s) | Status     | Level<br>Exceeded |
|--------|---------------|---------------------------|----------------|-------------------|-----------------------|------------|-------------------|
| 15.005 | 128           | 0.000                     | 0.81           |                   | 84.8                  | OK         |                   |
| 12.009 | 129           | 0.000                     | 2.30           |                   | 437.4                 | SURCHARGED |                   |
| 11.001 | 18            | 0.000                     | 0.91           |                   | 449.1                 | OK         |                   |
| 11.002 | 19            | 0.000                     | 0.83           |                   | 447.7                 | OK         |                   |
| 1.016  | 20            | 0.000                     | 0.91           |                   | 1061.7                | OK         |                   |
| 1.017  | 21            | 0.000                     | 1.06           |                   | 1058.8                | SURCHARGED |                   |
| 16.000 | 22A           | 0.000                     | 0.22           |                   | 8.0                   | OK         |                   |
| 16.001 | 22B           | 0.000                     | 0.15           |                   | 20.2                  | OK         |                   |
| 16.002 | 22            | 0.000                     | 0.38           |                   | 52.4                  | OK         |                   |
| 1.018  | 23            | 0.000                     | 1.06           |                   | 1084.3                | SURCHARGED |                   |
| 17.000 | 24A           | 0.000                     | 0.37           |                   | 13.3                  | OK         |                   |
| 17.001 | 24B           | 0.000                     | 0.68           |                   | 25.6                  | OK         |                   |
| 17.002 | 24C           | 0.000                     | 0.64           |                   | 35.7                  | OK         |                   |
| 1.019  | 24            | 0.000                     | 1.60           |                   | 1117.2                | SURCHARGED |                   |
| 1.020  | 25            | 0.000                     | 0.86           |                   | 1118.1                | OK         |                   |
| 1.021  | 26            | 0.000                     | 0.72           |                   | 1107.4                | OK         |                   |
| 1.022  | 27            | 0.000                     | 1.00           |                   | 1090.4                | OK         |                   |
| 1.023  | 28            | 0.000                     | 0.19           |                   | 113.0                 | SURCHARGED |                   |
| 1.024  | 29            | 0.000                     | 0.49           |                   | 113.0                 | OK         |                   |

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Phase  
2+3a new layout 21.3.5.SWS

### Simulation Criteria

|                                 |       |                                     |       |
|---------------------------------|-------|-------------------------------------|-------|
| Areal Reduction Factor          | 1.000 | Additional Flow - % of Total Flow   | 0.000 |
| Hot Start (mins)                | 0     | MADD Factor * 10m³/ha Storage       | 2.000 |
| Hot Start Level (mm)            | 0     | Inlet Coeffiecient                  | 0.800 |
| Manhole Headloss Coeff (Global) | 0.500 | Flow per Person per Day (l/per/day) | 0.000 |
| Foul Sewage per hectare (l/s)   | 0.000 |                                     |       |

|                             |   |                              |   |                              |   |
|-----------------------------|---|------------------------------|---|------------------------------|---|
| Number of Input Hydrographs | 0 | Number of Offline Controls   | 0 | Number of Time/Area Diagrams | 0 |
| Number of Online Controls   | 1 | Number of Storage Structures | 4 | Number of Real Time Controls | 0 |

### Synthetic Rainfall Details

|                          |                |        |             |       |
|--------------------------|----------------|--------|-------------|-------|
| Rainfall Model           | FSR M5-60 (mm) | 16.000 | Cv (Summer) | 0.750 |
| Region England and Wales | Ratio R        | 0.267  | Cv (Winter) | 0.840 |

```
Margin for Flood Risk Warning (mm) 300.0      DVD Status ON
      Analysis Timestep    Fine Inertia Status ON
      DTS Status          OFF
```

|                          |                                                                      |
|--------------------------|----------------------------------------------------------------------|
| Profile(s)               | Summer and Winter                                                    |
| Duration(s) (mins)       | 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880 |
| Return Period(s) (years) | 1, 30, 100                                                           |
| Climate Change (%)       | 0, 0, 40                                                             |

|       |       |           |        |        |         |           |               |           | Water    | Surcharged |        |
|-------|-------|-----------|--------|--------|---------|-----------|---------------|-----------|----------|------------|--------|
|       | US/MH |           |        | Return | Climate | First (X) | First (Y)     | First (Z) | Overflow | Level      |        |
| PN    | Name  | Storm     | Period | Change |         | Surcharge | Flood         | Overflow  | Act.     | Depth      |        |
| 1.000 | 301   | 15 Winter | 100    | +40%   | 30/15   | Summer    | 100/15 Winter |           |          | 92.720     | 1.575  |
| 1.001 | 302   | 15 Winter | 100    | +40%   | 30/15   | Summer    |               |           |          | 92.693     | 1.706  |
| 1.002 | 303   | 15 Winter | 100    | +40%   | 30/15   | Summer    |               |           |          | 91.684     | 1.012  |
| 1.003 | 304   | 30 Winter | 100    | +40%   | 100/15  | Summer    |               |           |          | 90.798     | 0.298  |
| 1.004 | 305   | 30 Winter | 100    | +40%   | 100/15  | Summer    |               |           |          | 90.554     | 0.719  |
| 1.005 | 306   | 30 Winter | 100    | +40%   | 100/15  | Summer    |               |           |          | 90.335     | 0.838  |
| 1.006 | 307   | 30 Winter | 100    | +40%   | 30/15   | Summer    |               |           |          | 90.011     | 1.079  |
| 1.007 | 308   | 30 Winter | 100    | +40%   | 30/15   | Winter    |               |           |          | 89.636     | 0.839  |
| 1.008 | 1     | 30 Winter | 100    | +40%   | 30/15   | Summer    |               |           |          | 89.132     | 1.456  |
| 2.000 | 2     | 30 Winter | 100    | +40%   | 30/15   | Summer    |               |           |          | 88.545     | 1.078  |
| 1.009 | 3     | 30 Winter | 100    | +40%   | 30/15   | Summer    |               |           |          | 88.547     | 1.521  |
| 3.000 | 228   | 15 Winter | 100    | +40%   | 100/15  | Summer    |               |           |          | 92.638     | 0.085  |
| 3.001 | 229   | 15 Winter | 100    | +40%   | 100/15  | Summer    |               |           |          | 92.346     | 0.738  |
| 3.002 | 230   | 15 Winter | 100    | +40%   | 30/15   | Summer    |               |           |          | 92.005     | 0.654  |
| 3.003 | 231   | 15 Winter | 100    | +40%   | 100/15  | Summer    |               |           |          | 88.932     | 0.163  |
| 3.004 | 232   | 15 Winter | 100    | +40%   | 100/15  | Summer    |               |           |          | 88.808     | 0.110  |
| 3.005 | 233   | 15 Winter | 100    | +40%   | 100/15  | Summer    |               |           |          | 88.694     | 0.045  |
| 4.000 | 201   | 15 Winter | 100    | +40%   |         |           |               |           |          | 93.585     | -0.140 |
| 4.001 | 202   | 15 Winter | 100    | +40%   |         |           |               |           |          | 92.689     | -0.140 |
| 4.002 | 203   | 30 Winter | 100    | +40%   | 100/15  | Summer    |               |           |          | 92.290     | 0.840  |
| 4.003 | 204   | 30 Winter | 100    | +40%   | 100/15  | Summer    |               |           |          | 92.210     | 0.900  |
| 4.004 | 205   | 30 Winter | 100    | +40%   | 30/15   | Summer    |               |           |          | 92.086     | 1.295  |
| 4.005 | 206   | 30 Winter | 100    | +40%   | 30/15   | Summer    |               |           |          | 91.953     | 1.420  |
| 5.000 | 207   | 15 Winter | 100    | +40%   | 100/15  | Winter    |               |           |          | 92.229     | 0.069  |
| 6.000 | 208   | 15 Winter | 100    | +40%   |         |           |               |           |          | 92.660     | -0.081 |
| 6.001 | 209   | 30 Winter | 100    | +40%   | 100/15  | Summer    |               |           |          | 92.214     | 0.439  |
| 6.002 | 210   | 30 Winter | 100    | +40%   | 100/15  | Summer    |               |           |          | 92.141     | 0.628  |
| 5.001 | 211   | 30 Winter | 100    | +40%   | 30/15   | Winter    |               |           |          | 91.997     | 1.018  |
| 4.006 | 212   | 30 Winter | 100    | +40%   | 30/15   | Summer    | 100/30 Winter |           |          | 91.783     | 1.631  |
| 7.000 | 213   | 30 Winter | 100    | +40%   | 100/15  | Summer    |               |           |          | 91.759     | 0.759  |

|                                                  |                                          |                                                                                     |
|--------------------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------|
| Coopers                                          |                                          | Page 32                                                                             |
| Park House<br>Sandpiper Court<br>Chester CH4 9QU | EDGEHILL PHASE 2<br>CUMBRIA<br>SW Design |  |
| Date 01/05/2019                                  | Designed by Coopers                      |                                                                                     |
| File 7503 3A + Planning.MDX                      | Checked by                               |                                                                                     |
| Micro Drainage                                   | Network 2018.1.1                         |                                                                                     |

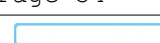
100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Phase 2+3a new layout 21.3.5.SWS

| PN    | US/MH Name | Flooded     |                            | Pipe       |            | Status | Level Exceeded |
|-------|------------|-------------|----------------------------|------------|------------|--------|----------------|
|       |            | Volume (m³) | Flow / Overflow Cap. (l/s) | Flow (l/s) |            |        |                |
| 1.000 | 301        | 0.307       | 0.62                       | 32.6       | FLOOD      |        | 1              |
| 1.001 | 302        | 0.000       | 1.81                       | 73.5       | FLOOD RISK |        |                |
| 1.002 | 303        | 0.000       | 2.34                       | 91.6       | SURCHARGED |        |                |
| 1.003 | 304        | 0.000       | 0.62                       | 95.6       | SURCHARGED |        |                |
| 1.004 | 305        | 0.000       | 0.81                       | 107.1      | SURCHARGED |        |                |
| 1.005 | 306        | 0.000       | 0.79                       | 122.9      | SURCHARGED |        |                |
| 1.006 | 307        | 0.000       | 1.87                       | 147.3      | SURCHARGED |        |                |
| 1.007 | 308        | 0.000       | 0.68                       | 140.5      | SURCHARGED |        |                |
| 1.008 | 1          | 0.000       | 0.98                       | 147.8      | FLOOD RISK |        |                |
| 2.000 | 2          | 0.000       | 0.12                       | 9.2        | SURCHARGED |        |                |
| 1.009 | 3          | 0.000       | 1.76                       | 160.5      | SURCHARGED |        |                |
| 3.000 | 228        | 0.000       | 0.62                       | 39.8       | SURCHARGED |        |                |
| 3.001 | 229        | 0.000       | 1.15                       | 91.5       | SURCHARGED |        |                |
| 3.002 | 230        | 0.000       | 1.69                       | 137.5      | SURCHARGED |        |                |
| 3.003 | 231        | 0.000       | 1.27                       | 174.6      | SURCHARGED |        |                |
| 3.004 | 232        | 0.000       | 1.45                       | 186.0      | SURCHARGED |        |                |
| 3.005 | 233        | 0.000       | 1.51                       | 190.3      | SURCHARGED |        |                |
| 4.000 | 201        | 0.000       | 0.30                       | 29.7       | OK         |        |                |
| 4.001 | 202        | 0.000       | 0.30                       | 29.4       | OK         |        |                |
| 4.002 | 203        | 0.000       | 0.32                       | 67.4       | SURCHARGED |        |                |
| 4.003 | 204        | 0.000       | 0.27                       | 104.6      | SURCHARGED |        |                |
| 4.004 | 205        | 0.000       | 0.49                       | 108.9      | FLOOD RISK |        |                |
| 4.005 | 206        | 0.000       | 0.43                       | 123.1      | FLOOD RISK |        |                |
| 5.000 | 207        | 0.000       | 0.82                       | 73.5       | SURCHARGED |        |                |
| 6.000 | 208        | 0.000       | 0.72                       | 55.3       | OK         |        |                |
| 6.001 | 209        | 0.000       | 0.56                       | 61.0       | SURCHARGED |        |                |
| 6.002 | 210        | 0.000       | 0.76                       | 84.3       | SURCHARGED |        |                |
| 5.001 | 211        | 0.000       | 0.54                       | 195.8      | SURCHARGED |        |                |
| 4.006 | 212        | 3.275       | 1.17                       | 244.6      | FLOOD      |        | 1              |
| 7.000 | 213        | 0.000       | 0.34                       | 45.8       | SURCHARGED |        |                |

|                                                  |                                          |                                                                                     |
|--------------------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------|
| Coopers                                          |                                          | Page 33                                                                             |
| Park House<br>Sandpiper Court<br>Chester CH4 9QU | EDGEHILL PHASE 2<br>CUMBRIA<br>SW Design |  |
| Date 01/05/2019                                  | Designed by Coopers                      |                                                                                     |
| File 7503 3A + Planning.MDX                      | Checked by                               |                                                                                     |
| Micro Drainage                                   | Network 2018.1.1                         |                                                                                     |

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Phase 2+3a new layout 21.3.5.SWS

| PN     | US/MH Name | Storm  | Return Period | Climate Change | First (X) SurchARGE | First (Y) Flood | First (Z) Overflow | Overflow Act. | Water Level (m) | Surcharged Depth (m) |
|--------|------------|--------|---------------|----------------|---------------------|-----------------|--------------------|---------------|-----------------|----------------------|
| 4.007  | 214 30     | Winter | 100           | +40%           | 30/15 Summer        |                 |                    |               | 91.708          | 2.135                |
| 4.008  | 215 30     | Winter | 100           | +40%           | 1/15 Summer         |                 |                    |               | 91.476          | 2.020                |
| 8.000  | 216 30     | Winter | 100           | +40%           | 100/30 Winter       |                 |                    |               | 91.721          | 0.021                |
| 8.001  | 217 30     | Winter | 100           | +40%           | 100/30 Summer       |                 |                    |               | 91.661          | 0.081                |
| 8.002  | 218 30     | Winter | 100           | +40%           | 100/15 Summer       |                 |                    |               | 91.630          | 0.960                |
| 8.003  | 219 30     | Winter | 100           | +40%           | 30/15 Summer        |                 |                    |               | 91.508          | 1.343                |
| 4.009  | 220 30     | Winter | 100           | +40%           | 1/15 Summer         |                 |                    |               | 91.331          | 1.922                |
| 4.010  | 221 30     | Winter | 100           | +40%           | 1/15 Winter         |                 |                    |               | 91.109          | 1.764                |
| 4.011  | 222 30     | Winter | 100           | +40%           | 1/15 Winter         |                 |                    |               | 90.948          | 1.647                |
| 4.012  | 223 30     | Winter | 100           | +40%           | 1/15 Winter         |                 |                    |               | 90.443          | 1.279                |
| 4.013  | 224 30     | Winter | 100           | +40%           | 100/15 Summer       |                 |                    |               | 90.124          | 1.020                |
| 4.014  | 225 30     | Winter | 100           | +40%           | 30/15 Summer        |                 |                    |               | 89.509          | 1.374                |
| 4.015  | 226 30     | Winter | 100           | +40%           | 30/15 Summer        |                 |                    |               | 89.089          | 1.345                |
| 4.016  | 227 30     | Winter | 100           | +40%           | 30/15 Summer        |                 |                    |               | 88.611          | 0.938                |
| 3.006  | 234 30     | Winter | 100           | +40%           | 100/15 Summer       |                 |                    |               | 87.853          | 0.482                |
| 1.010  | 5 30       | Winter | 100           | +40%           |                     |                 |                    |               | 83.990          | -0.204               |
| 9.000  | 6 15       | Winter | 100           | +40%           |                     |                 |                    |               | 84.488          | -0.102               |
| 9.001  | 7 15       | Winter | 100           | +40%           | 100/15 Winter       |                 |                    |               | 84.335          | 0.049                |
| 9.002  | 8 15       | Winter | 100           | +40%           | 100/15 Summer       |                 |                    |               | 84.240          | 0.330                |
| 9.003  | 9 15       | Winter | 100           | +40%           | 100/15 Summer       |                 |                    |               | 84.064          | 0.493                |
| 9.004  | 10 15      | Winter | 100           | +40%           | 30/15 Summer        |                 |                    |               | 83.902          | 0.788                |
| 1.011  | 11 30      | Winter | 100           | +40%           | 30/15 Summer        |                 |                    |               | 83.461          | 0.557                |
| 1.012  | 12 30      | Winter | 100           | +40%           | 100/30 Winter       |                 |                    |               | 82.972          | 0.097                |
| 1.013  | 13 30      | Winter | 100           | +40%           | 100/15 Summer       |                 |                    |               | 82.398          | 0.557                |
| 10.000 | 14A 15     | Winter | 100           | +40%           |                     |                 |                    |               | 84.185          | -0.165               |
| 10.001 | 14 15      | Winter | 100           | +40%           |                     |                 |                    |               | 82.779          | -0.116               |
| 1.014  | 15 30      | Winter | 100           | +40%           | 30/30 Winter        |                 |                    |               | 81.908          | 0.427                |
| 1.015  | 16 30      | Winter | 100           | +40%           | 100/15 Summer       |                 |                    |               | 81.373          | 0.140                |
| 11.000 | 17 30      | Winter | 100           | +40%           | 100/15 Summer       |                 |                    |               | 84.401          | 0.491                |
| 12.000 | 101 15     | Winter | 100           | +40%           | 100/15 Summer       |                 |                    |               | 94.963          | 0.913                |
| 12.001 | 102 15     | Winter | 100           | +40%           | 100/15 Summer       |                 |                    |               | 94.155          | 0.753                |
| 12.002 | 103 15     | Winter | 100           | +40%           | 30/15 Summer        |                 |                    |               | 93.020          | 2.081                |
| 12.003 | 104 15     | Winter | 100           | +40%           | 30/15 Summer        |                 |                    |               | 90.940          | 0.266                |
| 12.004 | 105 15     | Winter | 100           | +40%           |                     |                 |                    |               | 90.385          | -0.096               |
| 12.005 | 106 15     | Winter | 100           | +40%           |                     |                 |                    |               | 89.474          | -0.091               |
| 13.000 | 107 15     | Winter | 100           | +40%           |                     |                 |                    |               | 96.703          | -0.108               |
| 13.001 | 108 15     | Winter | 100           | +40%           | 100/15 Summer       |                 |                    |               | 95.711          | 0.186                |
| 13.002 | 109 15     | Winter | 100           | +40%           | 100/15 Summer       |                 |                    |               | 94.998          | 0.574                |
| 13.003 | 110 15     | Winter | 100           | +40%           | 100/15 Summer       |                 |                    |               | 93.606          | 0.414                |
| 13.004 | 111 15     | Winter | 100           | +40%           | 100/15 Summer       |                 |                    |               | 93.306          | 0.256                |
| 14.000 | 112 15     | Winter | 100           | +40%           | 100/15 Summer       |                 |                    |               | 93.917          | 0.081                |
| 14.001 | 113 15     | Winter | 100           | +40%           | 100/15 Summer       |                 |                    |               | 93.683          | 0.423                |
| 14.002 | 114 15     | Winter | 100           | +40%           | 100/15 Summer       |                 |                    |               | 93.454          | 0.299                |
| 13.005 | 115 15     | Winter | 100           | +40%           | 100/15 Summer       |                 |                    |               | 92.993          | 0.126                |
| 13.006 | 116 15     | Winter | 100           | +40%           |                     |                 |                    |               | 91.880          | -0.201               |
| 13.007 | 117 15     | Winter | 100           | +40%           |                     |                 |                    |               | 91.077          | -0.169               |
| 13.008 | 118 15     | Winter | 100           | +40%           |                     |                 |                    |               | 90.647          | -0.230               |
| 13.009 | 119 15     | Winter | 100           | +40%           | 100/15 Summer       |                 |                    |               | 88.874          | 0.074                |
| 12.006 | 120 15     | Winter | 100           | +40%           | 30/15 Summer        |                 |                    |               | 88.426          | 1.276                |
| 12.007 | 121 15     | Winter | 100           | +40%           | 30/15 Summer        |                 |                    |               | 87.765          | 2.454                |
| 12.008 | 122 15     | Winter | 100           | +40%           | 30/15 Summer        | 100/15 Winter   |                    |               | 86.691          | 2.642                |
| 15.000 | 123 15     | Winter | 100           | +40%           |                     |                 |                    |               | 89.311          | -0.050               |
| 15.001 | 124 15     | Winter | 100           | +40%           |                     |                 |                    |               | 87.607          | -0.090               |
| 15.002 | 125 30     | Winter | 100           | +40%           | 100/15 Winter       |                 |                    |               | 86.137          | 0.096                |
| 15.003 | 126 30     | Winter | 100           | +40%           | 100/15 Summer       |                 |                    |               | 85.901          | 0.576                |
| 15.004 | 127 15     | Winter | 100           | +40%           | 100/15 Summer       |                 |                    |               | 85.697          | 0.730                |

|                                                  |                                          |                                                                                    |
|--------------------------------------------------|------------------------------------------|------------------------------------------------------------------------------------|
| Coopers                                          |                                          | Page 34                                                                            |
| Park House<br>Sandpiper Court<br>Chester CH4 9QU | EDGEHILL PHASE 2<br>CUMBRIA<br>SW Design |  |
| Date 01/05/2019                                  | Designed by Coopers                      |                                                                                    |
| File 7503 3A + Planning.MDX                      | Checked by                               |                                                                                    |
| Micro Drainage                                   | Network 2018.1.1                         |                                                                                    |

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Phase 2+3a new layout 21.3.5.SWS

| PN     | US/MH Name | Flooded     |                            | Pipe       |            | Status | Level Exceeded |
|--------|------------|-------------|----------------------------|------------|------------|--------|----------------|
|        |            | Volume (m³) | Flow / Overflow Cap. (l/s) | Flow (l/s) |            |        |                |
| 4.007  | 214        | 0.000       | 1.67                       | 241.7      | SURCHARGED |        |                |
| 4.008  | 215        | 0.000       | 1.99                       | 247.3      | SURCHARGED |        |                |
| 8.000  | 216        | 0.000       | 0.73                       | 35.2       | SURCHARGED |        |                |
| 8.001  | 217        | 0.000       | 0.29                       | 47.3       | SURCHARGED |        |                |
| 8.002  | 218        | 0.000       | 0.55                       | 59.8       | SURCHARGED |        |                |
| 8.003  | 219        | 0.000       | 0.64                       | 98.4       | FLOOD RISK |        |                |
| 4.009  | 220        | 0.000       | 2.13                       | 287.6      | SURCHARGED |        |                |
| 4.010  | 221        | 0.000       | 2.47                       | 294.3      | SURCHARGED |        |                |
| 4.011  | 222        | 0.000       | 2.19                       | 322.6      | SURCHARGED |        |                |
| 4.012  | 223        | 0.000       | 2.47                       | 331.0      | SURCHARGED |        |                |
| 4.013  | 224        | 0.000       | 0.83                       | 336.3      | SURCHARGED |        |                |
| 4.014  | 225        | 0.000       | 1.05                       | 369.3      | SURCHARGED |        |                |
| 4.015  | 226        | 0.000       | 2.51                       | 390.2      | SURCHARGED |        |                |
| 4.016  | 227        | 0.000       | 1.58                       | 401.8      | SURCHARGED |        |                |
| 3.006  | 234        | 0.000       | 1.17                       | 599.7      | SURCHARGED |        |                |
| 1.010  | 5          | 0.000       | 0.64                       | 771.4      | OK         |        |                |
| 9.000  | 6          | 0.000       | 0.57                       | 32.2       | OK         |        |                |
| 9.001  | 7          | 0.000       | 0.62                       | 36.4       | SURCHARGED |        |                |
| 9.002  | 8          | 0.000       | 0.80                       | 45.5       | SURCHARGED |        |                |
| 9.003  | 9          | 0.000       | 0.61                       | 63.1       | SURCHARGED |        |                |
| 9.004  | 10         | 0.000       | 1.68                       | 113.5      | SURCHARGED |        |                |
| 1.011  | 11         | 0.000       | 3.52                       | 886.0      | SURCHARGED |        |                |
| 1.012  | 12         | 0.000       | 0.74                       | 887.3      | SURCHARGED |        |                |
| 1.013  | 13         | 0.000       | 1.17                       | 890.5      | SURCHARGED |        |                |
| 10.000 | 14A        | 0.000       | 0.16                       | 19.7       | OK         |        |                |
| 10.001 | 14         | 0.000       | 0.47                       | 50.9       | OK         |        |                |
| 1.014  | 15         | 0.000       | 1.46                       | 925.2      | SURCHARGED |        |                |
| 1.015  | 16         | 0.000       | 1.21                       | 934.4      | SURCHARGED |        |                |
| 11.000 | 17         | 0.000       | 0.83                       | 28.5       | SURCHARGED |        |                |
| 12.000 | 101        | 0.000       | 1.12                       | 66.3       | SURCHARGED |        |                |
| 12.001 | 102        | 0.000       | 1.33                       | 89.1       | SURCHARGED |        |                |
| 12.002 | 103        | 0.000       | 2.79                       | 106.5      | SURCHARGED |        |                |
| 12.003 | 104        | 0.000       | 1.54                       | 126.3      | SURCHARGED |        |                |
| 12.004 | 105        | 0.000       | 0.78                       | 155.9      | OK         |        |                |
| 12.005 | 106        | 0.000       | 0.81                       | 189.0      | OK         |        |                |
| 13.000 | 107        | 0.000       | 0.53                       | 46.1       | OK         |        |                |
| 13.001 | 108        | 0.000       | 0.83                       | 71.8       | SURCHARGED |        |                |
| 13.002 | 109        | 0.000       | 1.06                       | 98.5       | SURCHARGED |        |                |
| 13.003 | 110        | 0.000       | 1.45                       | 115.2      | SURCHARGED |        |                |
| 13.004 | 111        | 0.000       | 1.29                       | 129.9      | SURCHARGED |        |                |
| 14.000 | 112        | 0.000       | 0.64                       | 42.4       | SURCHARGED |        |                |
| 14.001 | 113        | 0.000       | 1.49                       | 55.8       | SURCHARGED |        |                |
| 14.002 | 114        | 0.000       | 1.27                       | 75.4       | SURCHARGED |        |                |
| 13.005 | 115        | 0.000       | 1.08                       | 204.0      | SURCHARGED |        |                |
| 13.006 | 116        | 0.000       | 0.58                       | 239.2      | OK         |        |                |
| 13.007 | 117        | 0.000       | 0.70                       | 238.3      | OK         |        |                |
| 13.008 | 118        | 0.000       | 0.48                       | 262.8      | OK         |        |                |
| 13.009 | 119        | 0.000       | 1.14                       | 304.1      | SURCHARGED |        |                |
| 12.006 | 120        | 0.000       | 3.72                       | 487.9      | SURCHARGED |        |                |
| 12.007 | 121        | 0.000       | 3.44                       | 489.6      | SURCHARGED |        |                |
| 12.008 | 122        | 3.626       | 3.59                       | 501.1      | FLOOD      |        | 3              |
| 15.000 | 123        | 0.000       | 0.93                       | 76.0       | OK         |        |                |
| 15.001 | 124        | 0.000       | 0.81                       | 110.3      | OK         |        |                |
| 15.002 | 125        | 0.000       | 0.53                       | 94.3       | SURCHARGED |        |                |
| 15.003 | 126        | 0.000       | 0.84                       | 125.5      | SURCHARGED |        |                |

|                             |                     |                                                                                     |
|-----------------------------|---------------------|-------------------------------------------------------------------------------------|
| Coopers                     |                     | Page 35                                                                             |
| Park House                  | EDGEHILL PHASE 2    |  |
| Sandpiper Court             | CUMBRIA             |                                                                                     |
| Chester CH4 9QU             | SW Design           |                                                                                     |
| Date 01/05/2019             | Designed by Coopers |                                                                                     |
| File 7503 3A + Planning.MDX | Checked by          |                                                                                     |
| Micro Drainage              | Network 2018.1.1    |                                                                                     |

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Phase 2+3a new layout 21.3.5.SWS

| PN     | US/MH<br>Name | Flooded        |                | Pipe              | Status     | Level<br>Exceeded |
|--------|---------------|----------------|----------------|-------------------|------------|-------------------|
|        |               | Volume<br>(m³) | Flow /<br>Cap. | Overflow<br>(l/s) |            |                   |
| 15.004 | 127           | 0.000          | 1.23           | 139.4             | SURCHARGED |                   |

|                             |                     |                                                                                     |
|-----------------------------|---------------------|-------------------------------------------------------------------------------------|
| Coopers                     |                     | Page 36                                                                             |
| Park House                  | EDGEHILL PHASE 2    |  |
| Sandpiper Court             | CUMBRIA             |                                                                                     |
| Chester CH4 9QU             | SW Design           |                                                                                     |
| Date 01/05/2019             | Designed by Coopers |                                                                                     |
| File 7503 3A + Planning.MDX | Checked by          |                                                                                     |
| Micro Drainage              | Network 2018.1.1    |                                                                                     |

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Phase 2+3a new layout 21.3.5.SWS

| PN     | US/MH Name | Storm      | Return Period | Climate Change | First (X) Surchage | First (Y) Flood | First (Z) Overflow | Overflow Act. | Water Level (m) | Surcharged Depth (m) |
|--------|------------|------------|---------------|----------------|--------------------|-----------------|--------------------|---------------|-----------------|----------------------|
| 15.005 | 128        | 15 Winter  | 100           | +40%           | 100/15 Summer      |                 |                    |               | 85.665          | 0.739                |
| 12.009 | 129        | 15 Winter  | 100           | +40%           | 30/15 Summer       |                 |                    |               | 85.634          | 1.671                |
| 11.001 | 18         | 30 Winter  | 100           | +40%           | 100/15 Summer      |                 |                    |               | 84.339          | 0.505                |
| 11.002 | 19         | 15 Winter  | 100           | +40%           | 100/15 Summer      |                 |                    |               | 82.272          | 0.337                |
| 1.016  | 20         | 30 Winter  | 100           | +40%           | 100/15 Summer      |                 |                    |               | 79.110          | 0.425                |
| 1.017  | 21         | 30 Winter  | 100           | +40%           | 30/15 Winter       |                 |                    |               | 77.147          | 0.546                |
| 16.000 | 22A        | 15 Winter  | 100           | +40%           |                    |                 |                    |               | 78.425          | -0.125               |
| 16.001 | 22B        | 15 Winter  | 100           | +40%           |                    |                 |                    |               | 78.274          | -0.147               |
| 16.002 | 22         | 15 Winter  | 100           | +40%           |                    |                 |                    |               | 76.682          | -0.088               |
| 1.018  | 23         | 30 Winter  | 100           | +40%           | 30/15 Winter       |                 |                    |               | 74.516          | 0.575                |
| 17.000 | 24A        | 15 Winter  | 100           | +40%           | 100/15 Summer      |                 |                    |               | 72.980          | 0.030                |
| 17.001 | 24B        | 15 Winter  | 100           | +40%           | 100/15 Summer      |                 |                    |               | 72.911          | 0.073                |
| 17.002 | 24C        | 15 Winter  | 100           | +40%           | 100/15 Summer      |                 |                    |               | 72.647          | 0.017                |
| 1.019  | 24         | 30 Winter  | 100           | +40%           | 30/15 Summer       |                 |                    |               | 72.372          | 0.860                |
| 1.020  | 25         | 30 Winter  | 100           | +40%           | 100/15 Summer      |                 |                    |               | 69.678          | 0.366                |
| 1.021  | 26         | 30 Winter  | 100           | +40%           | 100/15 Summer      |                 |                    |               | 67.092          | 0.737                |
| 1.022  | 27         | 30 Winter  | 100           | +40%           | 100/15 Summer      |                 |                    |               | 65.500          | 0.565                |
| 1.023  | 28         | 600 Winter | 100           | +40%           | 30/180 Winter      |                 |                    |               | 63.976          | 0.538                |
| 1.024  | 29         | 360 Summer | 100           | +40%           |                    |                 |                    |               | 59.692          | -0.228               |

| PN     | US/MH Name | Flooded Volume (m³) | Flow / Cap. | Overflow (l/s) | Pipe Flow (l/s) | Status     | Level Exceeded |
|--------|------------|---------------------|-------------|----------------|-----------------|------------|----------------|
| 15.005 | 128        | 0.000               | 1.24        |                | 130.7           | SURCHARGED |                |
| 12.009 | 129        | 0.000               | 3.16        |                | 602.4           | SURCHARGED |                |
| 11.001 | 18         | 0.000               | 1.26        |                | 622.8           | SURCHARGED |                |
| 11.002 | 19         | 0.000               | 1.15        |                | 623.8           | SURCHARGED |                |
| 1.016  | 20         | 0.000               | 1.34        |                | 1556.7          | SURCHARGED |                |
| 1.017  | 21         | 0.000               | 1.55        |                | 1557.3          | SURCHARGED |                |
| 16.000 | 22A        | 0.000               | 0.40        |                | 14.4            | OK         |                |
| 16.001 | 22B        | 0.000               | 0.26        |                | 36.2            | OK         |                |
| 16.002 | 22         | 0.000               | 0.68        |                | 93.9            | OK         |                |
| 1.018  | 23         | 0.000               | 1.55        |                | 1594.5          | SURCHARGED |                |
| 17.000 | 24A        | 0.000               | 0.64        |                | 22.9            | SURCHARGED |                |
| 17.001 | 24B        | 0.000               | 1.13        |                | 42.5            | SURCHARGED |                |
| 17.002 | 24C        | 0.000               | 1.03        |                | 57.4            | SURCHARGED |                |
| 1.019  | 24         | 0.000               | 2.34        |                | 1637.1          | SURCHARGED |                |
| 1.020  | 25         | 0.000               | 1.26        |                | 1637.5          | SURCHARGED |                |
| 1.021  | 26         | 0.000               | 1.06        |                | 1633.2          | SURCHARGED |                |
| 1.022  | 27         | 0.000               | 1.50        |                | 1632.1          | SURCHARGED |                |
| 1.023  | 28         | 0.000               | 0.19        |                | 113.4           | SURCHARGED |                |
| 1.024  | 29         | 0.000               | 0.49        |                | 113.4           | OK         |                |