Sarah Westwood

From: Richard Percy [richardp@abbott-associates co uk]
Sent: 05 October 2012 15:35
To: Sarah Westwood
Subject: FW: 4 Acres Residential Site, Clitheroe - Outline Drainage Strategy Report
Attachments: Outline Drainage Strategy_Final Report 12390i1.pdf

Sarah
Drainage report as discussed. Appendices to follow.
Regards.

Richard

From: sammy.spaine@amec.com [mailto:sammy.spaine@amec.com]
Sent: Wednesday October 03 2012 17:04
To: Richard Percy
Cc: chris.prydderch@amec.com; Guy Pearson; john.hall3@amec.com; kath.smithers@amec.com; tracey.wood2@amec.com
Subject: 4 Acres Residential Site, Clitheroe - Outline Drainage Strategy Report

Richard,

Please find attached the final version of our Outline Drainage Strategy Report as promised The Appendices will be forwarded to you under a separate email cover
I will await your formal instruction before forwarding the report to United Utilities.

Regards
Sammy Spaine

From: Richard Percy <richardp@abbott-associates.co.uk>
To: 'sammy spaine@amec com'" <sammy.spaine@amec.com>
Cc: "chris.prydderch@amec.com" <chris.prydderch@amec.com>, Guy Pearson <guy.pearson@tayloryoung.co.uk>, "john.hall3@amec.com" <john.hall3@amec.com>, "kath.smithers@amec.com" <kath.smithers@amec.com> "tracey.wood2@amec.com" <tracey.wood2@amec.com>
Date: 03/10/2012 13:48
Subject: RE: 5613 - 4 Acres Residential Site Clitheroe Issue 5

Thanks Sammy
Regards.

Richard

From: sammy.spaine@amec.com [mailto:sammy.spaine@amec.com]
Sent: Wednesday October 03 2012 11:57
To: Richard Percy

Cc: chris.prydderch@amec.com; Guy Pearson; john.hall3@amec.com; kath.smithers@amec.com; tracey.wood2@amec.com
Subject: RE: 5613 - 4 Acres Residential Site, Clitheroe Issue 5

Richard,

I received the copy of your revised Masterplan from Guy Pearson yesterday afternoon. The Final version of our Outline Drainage Strategy Report has been completed, incorporating the revised Masterplan This is now being formatted by Professional Support Team and will be issued to you today.

Regards
Sammy Spaine

From: Richard Percy <richardp@abbott-associates.co.uk>
To: '"sammy spaine@amec.com"' <sammy.spaine@amec.com> Guy Pearson <guy.pearson@tayloryoung.co.uk>
Cc: john.hall3@amec.com' <john.hall3@amec.com> "chris.prydderch@amec.com" <chris.prydderch@amec.com>
Date: 02/10/2012 13:54
Subject: RE: 5613 - 4 Acres Residential Site, Clitheroe Issue 5

Sammy
Can you give me an ETA for the revised report?
Thanks.

Richard

From: sammy.spaine@amec.com[mailto:sammy.spaine@amec.com]
Sent: Tuesday October 02 2012 13:36
To: Guy Pearson
Cc: Richard Percy; john.hall3@amec.com; chris.prydderch@amec.com
Subject: RE: 5613 - 4 Acres Residential Site, Clitheroe Issue 5

Guy,

Thanks for forwarding a copy of your revised Masterplan to me yesterday. Our Constraints Plan (Drawing No. 29421_N_CVD_109B), has been updated accordingly and a copy is attached. I note however that there is still insufficient clearance for the required easement strip for the section of the existing private surface water drain between Manholes' MH S13 and MH 1.

Regards
Sammy Spaine BEng Hons, CEng MICE, AMAE, APMP
Technical Director
AMEC
Environment and Infrastructure UK Ltd
Windsor House, Gadbrook Business Centre, Northwich Cheshire CW9 7TN UK
Tel +44 (0) 01606 354800, Fax +44(0) 01606 354810
Direct +44 (0)01606 354842 mobile/cell 07803 078418
mailto:sammy.spaine@amec.com
amec.com

From: Guy Pearson <guy.pearson@tayloryoung.co.uk>
To: Richard Percy <richardp@abbott-associates.co.uk> "'sammy spaine@amec com'" <sammy.spaine@amec.com>
Date: 02/10/2012 11:55
Subject: RE: 5613 - 4 Acres Residential Site Clitheroe Issue 5

Richard,

we have shown a garage for 2 - 3 properties on the southern boundary There is also plenty of room for parking in front of the gable end of the NE most unit

Kind Regards

Guy Pearson
Associate Director

IBI TaylorYoung
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Wilmslow Road
Handforth
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DDI +44(0)1625 542 252
Tel +44(0)1625 542 200
Fax +44(0)1625 542 250

guy.pearson@tayloryoung.co.uk
www.tayloryoung.co.uk
IBI TaylorYoung is part of the IBI Group

From: Richard Percy [mailto:richardp@abbott-associates.co.uk]
Sent: 02 October 2012 08:54
To: Guy Pearson; 'sammy.spaine@amec.com'
Subject: RE: 5613 - 4 Acres Residential Site, Clitheroe Issue 5

Guy

Thanks for that and for turning this round so quickly.
I appreciate that this is only illustrative, but I can't see how the new/repositioned units to the south east of the pond will work, particularly parking-wise. Can you have another quick look at that please.
Sammy – as this is only a drafting issue, can you proceed with your report on the basis of what Guy has currently produced and we can slot any further amended plan later today/this week.
Regards.

Richard

From: Guy Pearson (IBI Taylor Young (Handforth)) [mailto:guy.pearson@tayloryoung.co.uk]
Sent: Monday October 01 2012 16:19
To: Richard Percy
Subject: 5613 - 4 Acres Residential Site, Clitheroe Issue 5

5613 - 4 Acres Residential Site, Clitheroe Issue 5

Please click hereto access the documents for this issue

Richard/Sammy,

following our meeting last week would you download and review the revised drawings and let me know if any amendments are required.

Richard, will any amendments be required to the D&AS?

Regards,

Guy
Kind Regards

Guy Pearson
Associate Director

IBI TaylorYoung
Chadsworth House
Wilmslow Road
Handforth
Cheshire
SK9 3HP

Tel 01625 542252
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Guy.Pearson@tayloryoung.co.uk
www.tayloryoung.co.uk
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Trustees of the Standen Estate

4 Acre Site at Littlemoor, Clitheroe

Outline Drainage Strategy

October 2012

AMEC Environment & Infrastructure UK Limited

Trustees of the Standen Estate

4 Acre Site at Littlemoor, Clitheroe

Outline Drainage Strategy

October 2012

AMEC Environment & Infrastructure UK Limited

Report for

Trustees of the Standen Estate
C/o Mr Richard Percy
Steven Abbott Associates LLP
Broadsword House
2 Stonecrop
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Document Revisions

No	Details	Date
1	Draft Report 12378i1	Sept 2012
2	Final Report 12390i1	Oct 2012

Executive Summary

AMEC Environment & Infrastructure UK Ltd (AMEC) was commissioned in September 2012 by the Trustees of the Standen Estate to produce an Outline Drainage Strategy in support of their Planning Application for the development of 49 Residential Units at a parcel of land located between Littlemoor and Whalley Road, in Clitheroe, Lancashire.

With respect to Surface Water Flows, drainage calculations undertaken by AMEC show that there will be a requirement for attenuation to reduce the anticipated Peak Surface Water Runoff Rate to the existing Greenfield runoff rate. The existing characteristics of the site (sloping topography from north east to south west, Culverted Watercourse, Open Watercourse downstream of the site) make it possible to incorporate a combination of the SUDS Structures (Permeable Paving and Attenuation Pond/ Sub-Surface Storage), into the management of the anticipated Surface Water Runoff from the site.

The assessment undertaken by AMEC shows that the anticipated Surface Water Runoff from the proposed development can be safely managed within the site boundary. (Estimated flows - 185m^3: using Sub Surface Storage/ Permeable Paving, and 540m^3: using Attenuation Pond Storage). Formal approval will be required from the Environment Agency and other Local Statutory Authorities at Reserve Matters/ Detailed Design stage

With regards to foul drainage, our calculations show that the anticipated Foul Flow from the proposed development is approximately 2.5 l/s. The hydraulic capacity of the existing combined sewer crossing the site is estimated to be approximately 45 l/s, based on information obtained on site. Our calculations therefore show that the existing combined sewer crossing the site should have sufficient capacity to accommodate the anticipated foul flows from the proposed development. The section of the existing public combined sewer crossing the site was surveyed in its entirety and found to be generally in a good state, both structurally and hydraulically. The proposed connection points into the public sewer network from the development are as shown on a "Constraints Plan" Drawing No. 29421_N_CVD_109B.

Formal approval to discharge anticipated foul drainage from the proposed development into the existing public combined sewer crossing the site will be required from United Utilities at Reserve Matters/ Detailed Design Stage.

The existing public combined sewer crossing the site will require a 6m wide easement, over which there can be no development. The current housing layout does take into account this need for a 6m wide easement.

Contents

1. Introduction

1.1 Context

AMEC Environment & Infrastructure UK Ltd (AMEC) was commissioned in September 2012 by the Trustees of the Standen Estate to undertake an Outline Drainage Strategy in support of their Planning Application for the development of 49 Residential Units at a parcel of land located between Littlemoor and Whalley Road, in Clitheroe, Lancashire (referred to as the site).

The site is currently entirely a Greenfield site, with periodic low-level cattle grazing activity. (See photograph 1 below).

Photo 1 Greenfield Site (with cattle grazing activity)

The Planning Application was submitted in April 2012, but not validated until 21st May. The application is at the Outline Stage at present. The current Illustrative Masterplan shows 8 No. Bungalows, 19 No. 2/3 Bed Semi /Terraced Properties, 12 No. 3 Bed Semi-Detached properties, and 10 No. 3/4 Bed Detached Properties. (A copy of the illustrative Masterplan has been included in Appendix A of this report). We do not have any details of the current programme for developing the site.

The current requirement for an Outline Drainage Strategy is in response to United Utilities' (UU's) Holding Objection to the Planning Application for the 4-Acre site, pending the submission of a Load and Flow Impact Assessment for the foul drainage. (Copy of UU's letter dated 10th August 2012 has been included in Appendix B of this report).

An email dated 30th August 2011 was sent by Mr. John Lunt (Business Analyst, UU) to Ms. Sarah Westwood, (Senior Planning Officer, Ribble Valley Borough Council), granting approval in principle to this proposed development, subject to provision of "separate drainage systems, with foul water flows only discharging into the combined public sewerage system serving the area. Surface Water Run-off generated from the proposed development would have to discharge directly into the adjacent watercourse with the prior consent of The Environment Agency".

AMEC contacted Mr. Daniel McDermott, (the author of UU's afore-mentioned letter) on Tuesday 4th September 2012 to discuss the contents of his letter and was referred to Mr. Graham Perry, also at UU.

UU's letter dated 10th August 2012, superseding the aforementioned email, has been sent out on the basis of the many planning applications for new developments within the catchment which have been submitted over the past twelve months. UU are concerned that their current infrastructure may not have sufficient capacity to serve all the proposed development currently up for planning.

On Wednesday 5th September 202, AMEC received a call from Mr. Graham Perry of UU. Mr. Perry explained the reasoning behind UU's holding objection to the Planning Application. The final scope of works for this report was eventually defined following discussions between AMEC and Mr. Graham Perry of UU. (See Appendix C for copy of email correspondence).

The full detail of the agreed scope of works for this Outline Drainage Strategy is as follows:

- An estimation of the anticipated Foul Flows and Surface Water Run-offs from the proposed development. (Surface Water Run-offs to be assessed on the basis of the Greenfield Run-off Rate for the catchment);
- Identification of the proposed discharge outfalls;
- A Masterplan showing details of the house types being proposed including the Phasing (Programming) of the development; and
- A "Constraints Plan" consisting of current topographical survey data, superimposed over the current Masterplan, merged with the existing sewer information. This plan would also contain the discharge points, together with the values of the anticipated flows. (Foul & Surface Water)

AMEC attended the site on Wednesday 12th and Friday 13th September 2012, following formal approval from United Utilities, to undertake CCTV/ Connectivity and Manhole Surveys of the sections of public and private sewers crossing the proposed development site. The findings are discussed in detail in section two of this report.

This assessment is limited to the provision of an Outline Drainage Strategy for the proposed development of the site.

The following documents were issued to AMEC prior to confirmation of our appointment:

- A copy of UU's letter dated 10th August 2012, forwarded to AMEC by Mr. Richard Percy via email dated 4th September 2012;
- An illustrative Masterplan of the development in PDF Format, showing the indicative red line Phase 1 boundary of the proposed development, together with details of the house types being proposed; and
- A Topographical Survey Plan, (in digital format), undertaken by Survey Operations and dated March 2011.

1.2 Previous Work Undertaken

1.2.1 Services Study N028i2

In March 2012, AMEC was commissioned by the Trustees of the Standen Estate to undertake a "Services Study" for the 4-Acre Site located between Littlemoor and Whalley Road, Clitheroe, Lancashire. A report of the "Services Study" was issued by AMEC in April 2012, reference: N028i2.

This "Services Study" was undertaken to support the Planning Application for a proposed residential development at the site. The requirement for the "Services Study Report" was mainly to identify and described the extent of existing key services located within the footprint of, and the immediate vicinity of the proposed development site, and not to confirm whether there was sufficient capacity in the system to service the development. Records of existing services/utilities, including drawings, were obtained from the relevant Statutory Undertakers. Additional information was also obtained from a site visit undertaken by AMEC on 15 March 2012. The "Services Study" confirmed the presence of a number of existing public/ private services, including a Private 300mm diameter Surface Water Drain, a 300mm diameter Public Combined Sewer, and a 100mm diameter Private Combined Sewer, crossing the site, and likely to present a potential constraint to the future development of the site.

The approximate alignments of the services identified were presented on Drawing No 29421_N_CVD_107, (copy included in Appendix D of this report), and was considered sufficient for the purpose of lodging an initial Planning Application to develop the site. The Service Plan drafted by AMEC (see Appendix E), shows the existence of a Private 300mm Surface Water Drain, as well as one Private and one Public Combined Sewer crossing the site.

1.2.2 Flood Risk Assessment

In April 2012, AMEC was commissioned by the Trustees of the Standen Estate to undertake a Flood Risk Assessment for the proposed construction of 49 Residential Units at the 4-Acre Site located between Littlemoor and Whalley Road, Clitheroe, Lancashire. Listed below are a number of points extracted from the Flood Risk Assessment Report which are considered relevant to this Outline Drainage Strategy:

The Site:

The site and the area immediately surrounding it are relatively flat with a gentle fall from east to west. A topographic survey carried out in July 2011 (see Appendix A) shows that the site has a gentle slope of approximately 0.032m/m from northeast to southwest, with the ground elevations ranging between 76.89mAOD to 82.91mAOD.

The Environment Agency has stated in recent correspondence (see Appendix E) that the existing Greenfield Runoff Rate adopted for the calculations should be 10 l/s/ha. (Litres per second per hectare).

Hydrology and Drainage

Pendleton Brook is the nearest watercourse to the site, flowing in an east-southeast to west-northwest direction. At its closest point to the site (130m) the ground elevation is approximately 73mAOD (as shown on Ordnance Survey mapping). Another watercourse, Mearley Brook, flows in a north to south direction via a series of weirs and a reservoir. The reservoir is located 225m west southwest of the site (at an elevation of approximately 70mAOD).

Geology, Hydrogeology and Soils

British Geological Survey (BGS) DiGMap3 data shows the bedrock at the site to be Bowland High Group and Craven Group, made up of Mudstone, Siltstone and Sandstone. The BGS website13 shows the Clitheroe Limestone Formation and Hodder Mudstone formation to be the dominant bedrock formation while the superficial geology is made up of Till and Diamicton. There is an extensive limestone quarry at Clitheroe from which limestone is extracted for cement production. Pendle Hill, Waddington Fell, the Bowland Hills and Longridge Fell are all predominantly formed of Millstone Grit.

At the site location the bedrock is designated as a Secondary A aquifer. The Environment Agency website14 defines this as "A permeable layer capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers." This area is also defined as having soils with a high leaching potential, which means any liquid discharges have the potential to move rapidly to underlying strata or shallow groundwater.

Permeability

The FEH CD-ROM gives an SPRHOST value of 42.1 for the site. This indicates a moderate to low soil permeability hence high Greenfield Run-off Rate provided by the Environment Agency. The Flood Studies Report Winter Rainfall Acceptance Potential (WRAP) Map also indicates that the site is located with a zone of low permeability, on the basis of soil characteristics. This is consistent with the FEH CD-ROM. The FEH CD-ROM gives a BFIHOST value of 0.349 which confirms the low permeability of the catchment.

Groundwater Flooding

The SFRA10 determined that using the best available information groundwater flooding was not considered to be a significant risk at the time of writing (2010). However the Envirocheck report11 presents BGS groundwater flooding susceptibility maps and shows the site to have a moderately high susceptibility over the large majority of the area. The area is known to be underlain by Limestone which is fairly permeable; however the WRAP map and FEH CD ROM suggest that the soils have a low permeability which would act as a barrier to rising groundwater. This low soil permeability, coupled with a high Annual Rainfall (SAAR of 1274mm) means that surface water only drains away at a slow rate, resulting in Ponding. This correlates with our observations during our site visit as indicated by the photograph below

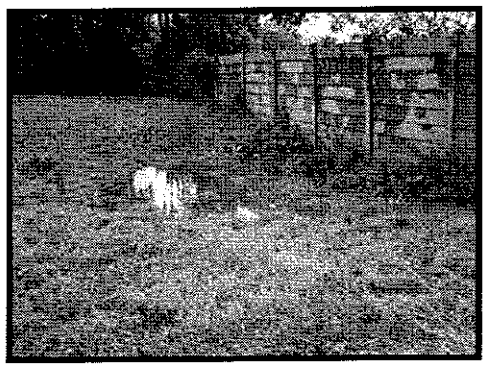


Photo 2 Ponding noted on Site (adjacent to 157/ 159 Whalley Road

Sewer Flooding

There is currently a minor risk of sewer flooding on the site due to the existence of at least 2 No. sections of Public Sewers and 1 No. Private Drain crossing the site. UU have been contacted to

request that as part of the development, the Public Sewers should be diverted around the site to reduce the risk of sewer flooding and enable the construction of the development. UU have confirmed that they would have no objection to diverting the existing sewer as long as a Section 185 Diversion Agreement is entered into prior to commencement. UU's stipulation is for all anticipated foul discharge from the proposed 49 No. Residential Units be discharged offsite via the existing 300mm diameter Public Combined Sewer. No surface water flow would be allowed into the existing Combined Sewer. This should be dealt with separately within the surface water drainage strategy. UU have stated that the points of connection and discharge rates cannot be reserved for a particular development and they reserve the right to revise any points of connection and discharge rates between the date of enquiry and the date that the connection is required. Consultation with the owners of the private sewers will need to be undertaken to determine whether an agreement can be meet for the diversion of these pipes. Therefore a low residual risk of sewer flooding remains.

UU have recorded a sewer flooding incident 300m north of the site. There are no other records of sewer flooding near the site.

Recommendations made in AMEC's FRA Report

The following recommendations made in the previous FRA Report produced by AMEC are deemed to be relevant to this Outline Drainage Strategy:

- A site-specific investigation should be undertaken prior to installation of the SuDS features to determine the infiltration rate and whether infiltration SuDS options are appropriate for this site. This investigation to support detailed drainage proposals would be undertaken as a pre-commencement planning condition attached to the outline consent;
- The proposed development will result in an approximate increase in impermeable surfaces of 7,426m2, which will increase surface runoff. To comply with the discharge rate and NFFP, 476.5m3 of storage would have to be provided to attenuate the runoff for 1% AEP plus climate change event if no other SuDS were proposed. It is therefore recommended that permeable paving is utilised where ever possible and that filter strips are included along the access road verges. All remaining surface water runoff would then be diverted to an attenuation basin which would control the discharge rate to: 10 l/s/ha;
- The preferred surface water outfall option would be via the existing privately owned surface water pipes. An agreement with the owner should be sought together with an investigation as to whether it is feasible to discharge into this network. The investigation would need to determine the discharge location and current state and capacity of the network to ensure that the additional discharge (of 10 l/s/ha) did not result in any increase in flood risk elsewhere; and
- Low points within the site where water might pond should be avoided by careful profiling of the ground to allow overland drainage away from the buildings and safe discharge to SuDs storage features without causing increased flood risk elsewhere. This may require some raised shallow bunds to convey water to the storage feature and prevent the water leaving the site in an uncontrolled manner.

1.3 Structure of the Report

The remainder of this report is structured as follows:

- Section 2: Description of Existing Public Sewers (Based on records held by UU);
- Section 3: Findings of the CCTV/ Connectivity and Manhole Surveys;
- Section 4: Outline Drainage Strategy;
- Section 5: Conclusions; and
- Section 6: Recommendations.

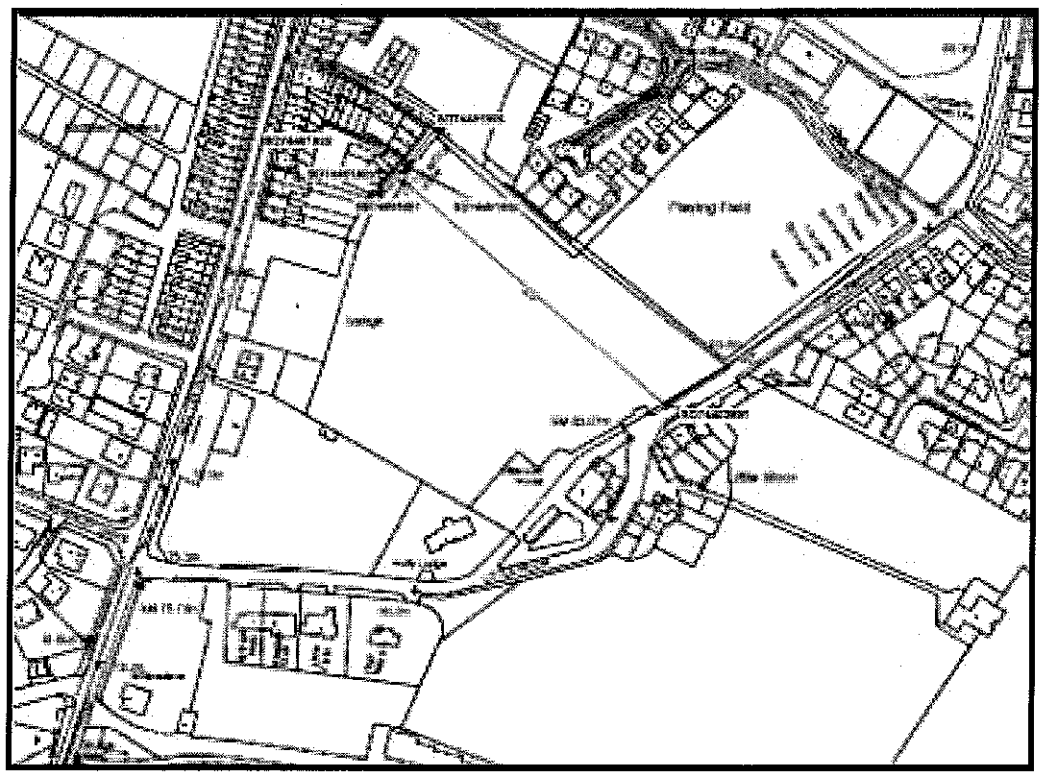
2. Existing Sewers: based on UU's Record

2.1 Foul Sewer

Records procured from United Utilities indicate that there is a 300mm diameter Vitrified Clay, Public Combined Sewer crossing the site from a manhole chamber located in Littlemoor. This combined sewer then follows a north-westerly direction, downstream towards Little Moor View. (As indicated by the red line on Figure 1 below). From Little Moor View the combined sewer connects into a 375mm diameter sewer located in Whalley Road.

There are no other Public Foul/ Combined Sewers shown on UU's record, within the footprint of the proposed development.

Figure 1 Extract from Public Sewer Record



2.2 Surface Water Sewer

UU's Public Sewer Records indicate that there is no Public Surface Water Sewer either within the footprints of, or in close proximity of the site.

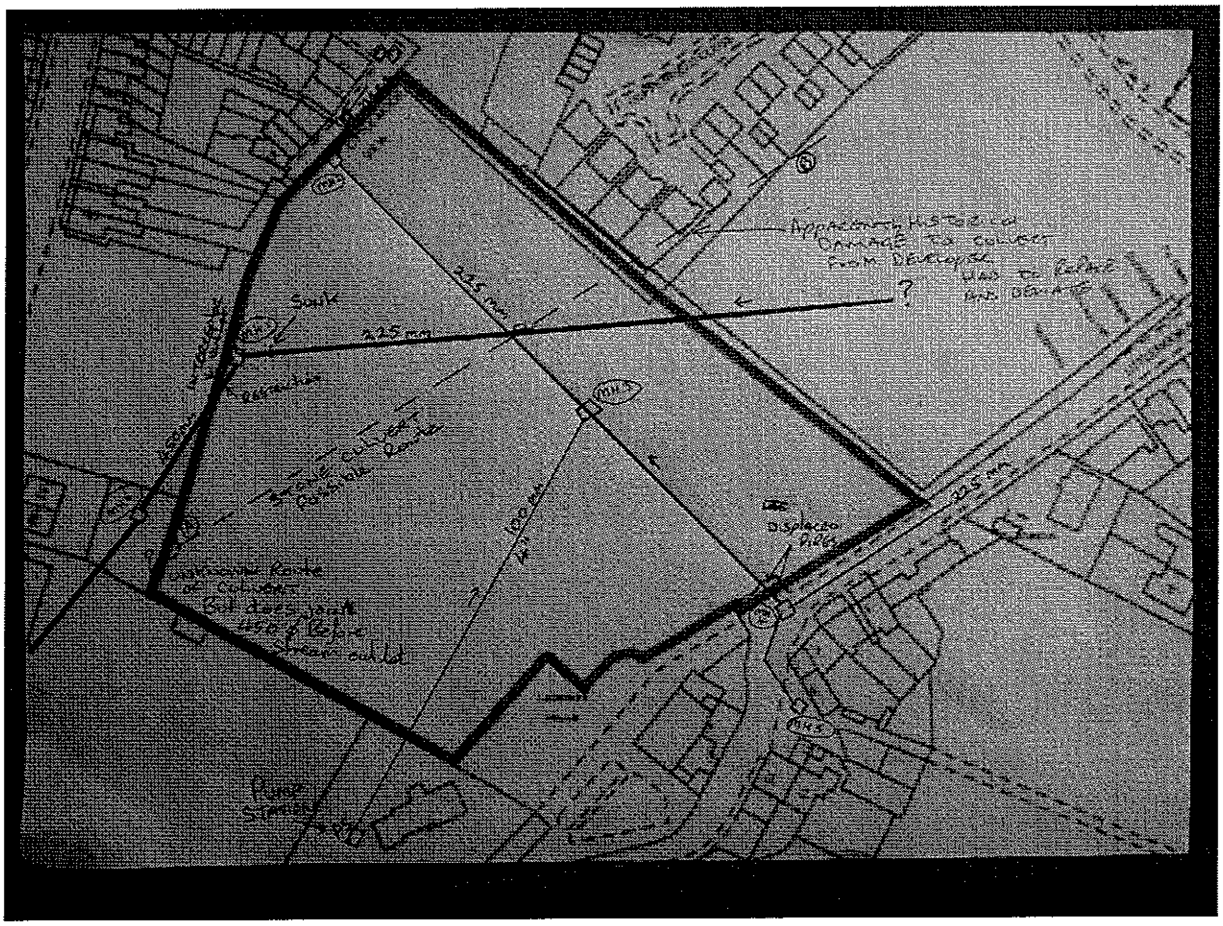
amec

3. CCTV/Connectivity Survey

3.1 Results of CCTV/Connectivity Surveys

As mentioned earlier, AMEC attended the site on Wednesday 12th and Thursday 13th September 2012, following formal approval from United Utilities, to undertake CCTV/ Connectivity and Manhole Surveys of the sections of both Public and Private Sewers crossing the proposed development site. The findings are listed in section 3.1.1 below, and should be read in conjunction with the site plan (Figure 2) below. A full-sized copy of this plan has been included in Appendix F of this report.

Figure 2 Copy of Site Sketch Received from Survey Contractor



3.1.1 Findings

The following information was confirmed following the CCTV/ Connectivity and Manhole Surveys:

Public Combined Sewer

- The survey confirmed the existence of a 225mm (marked as 300mm diameter on UU's Sewer Records) Combined Public Sewer crossing the site from Manhole Ref. 4, located in Littlemoor and follows a north-westerly direction, downstream towards Manhole Ref. 2, at Whalley Road. The survey confirmed that this section of sewer is generally in a fair state both structurally and hydraulically. However, it was noted that the section of this sewer immediately downstream of Manhole Ref. 4 contains a number of slightly displaced joints, and approximately 5 – 10% silt deposits within the pipe section.

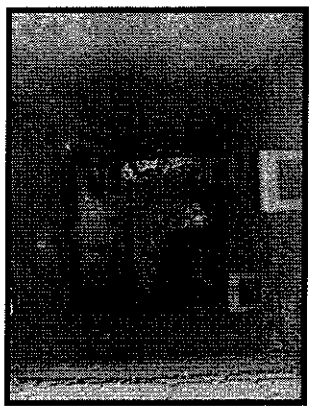


Photo 3 **Manhole Ref. 4 Internal View**

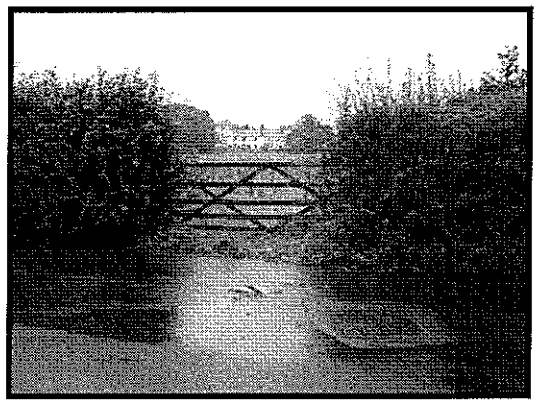


Photo 4 **Manhole Ref. 4 – Plan View Looking towards Site**

Photo 5 **Manhole Ref. 2 – Internal View**

Photo 6 **Manhole Ref. 2 – Plan View Sewer Turning Northwards**

- A third manhole was noted along the sewer line between Manhole Ref. 4 and Manhole Ref. 2, approximately 70m downstream of Manhole Ref.4. Dye testing confirmed that this manhole receives foul flows from a Pumping Station serving the property known as Holly Lodge (See photograph 7 on page 11). The sewer section between Holly Lodge and Manhole Ref.3 is a 100mm diameter Rising Main.

- The Public Combined Sewer leaves the site at Manhole Ref 2 where it turns northwards towards an existing 300mm diameter sewer located at Littlemoor View (See photo 5 above).
- No other Foul or Combined Public Sewer was noted on the site.

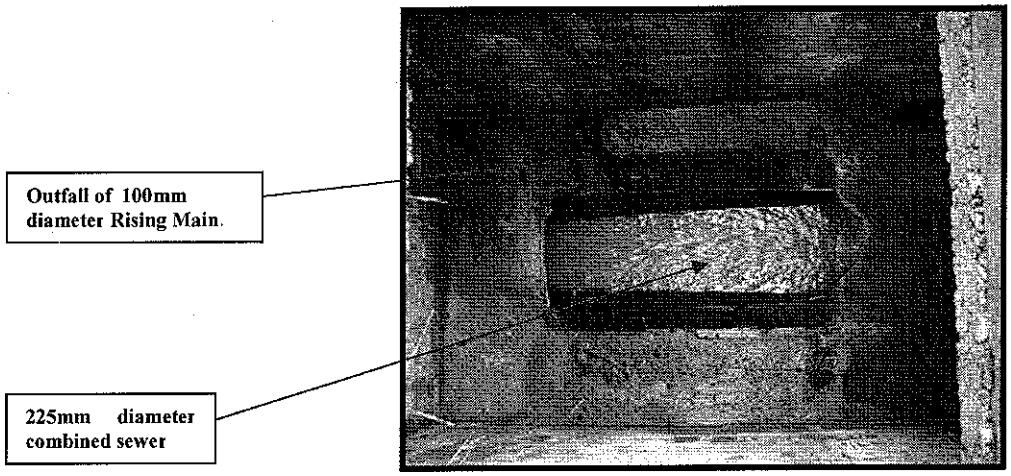


Photo 7 **Manhole Ref. MH3, Showing Connectivity to Combined Sewer (between MH4 & MH2); also showing Incoming 100mm Rising Main from Holly Lodge**

Private Surface Water Drain

- There are no recorded Public Surface Water Sewers crossing the site.
- Our site survey however confirmed the existence of a 225mm diameter Private Surface Water Drain crossing the site from beneath the adjacent Rugby Pitch and connecting into Existing Manhole Ref. 1 located at the rear of the existing Petrol Filling Station.
- A CCTV Survey was undertaken commencing from Manhole Ref. 1 upstream. The survey was abandoned approximately 4m upstream of Manhole Ref. 1 due to the presence of a high percentage of debris within the pipe. There is a possibility of a partial pipe collapse at this point. This was evidenced from the turbulence in the flows arriving into Manhole Ref. 1 upstream, suggesting a restriction to the incoming flows from upstream of the manhole. (See photo 8 below).
- The section of drain surveyed was noted to be a 225mm diameter Vitrified Clay Surface Water Drain.

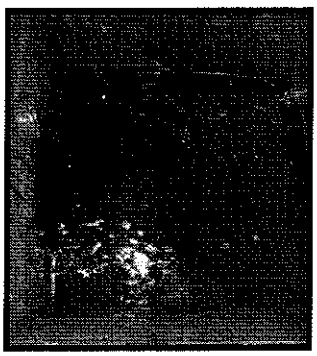


Photo 8 **Manhole Ref. 1; 225mm Diameter Sewer Changes Direction at Whalley Road; also Turbulent Flows noted**

- A CCTV Survey was undertaken commencing from Manhole Ref. 1 downstream towards Manhole Ref. 6. The drain had to be cleaned out for the first 10m of its length to enable to survey to proceed. The survey confirmed that the section of drain between Manhole Ref. 1 and Manhole Ref. 6, is a 450mm diameter Vitrified Clay Circular Drain containing settled deposits of debris resulting in a loss of internal cross-sectional area within the drain. Copies of Record Cards for all manholes surveyed are to be found in Appendix K of this report.

- The section of drain from Manhole Ref. 6 downstream was also surveyed. It was proven to be a 450mm diameter Vitrified Clay Circular Drain. There's a restriction of flow noted within this section of drain, approximately 5.6m downstream of Manhole Ref. 6, which was causing approximately 30% loss of internal pipe capacity, leading to a backup of flows towards Manhole Ref.6. Dye testing confirmed that this drain discharges into the stream via a sluice located at Primrose Bridge. (See photo 9 below). The small trickle of flow noted at the outfall pipe even though it was raining heavily at the time of the survey, would indicate the presence of a possible structural defect within this section of the drain.

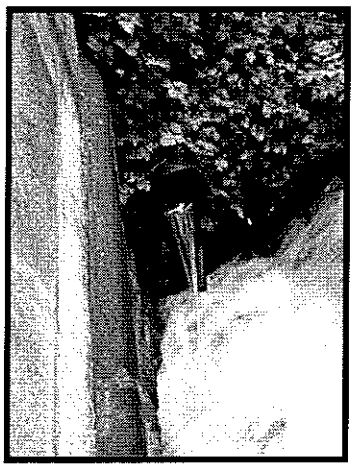


Photo 9 **Confirmation of Surface Water Outfall Point at Primrose Bridge, Whalley Road**

Culverted Watercourse

- From anecdotal evidence, (discussions with local residents during the time of the survey) we note that there's a Culverted Watercourse crossing the site in a south westerly direction from Copperfield Close. It was not possible to survey this structure as there was no formal access to it above ground. However during our site investigations, we noted the presence of a "Sink" (See Photo 10 below) at the lowest point of the field, close to its boundary with the properties located at No.'s 157-159 Whalley Road. This is believed to be a point over the existing Brick/ Stone Culvert Structure currently used to drain sections of the field. Further investigation of this structure is highly recommended at Reserve Matters/ Detailed Design Stage.

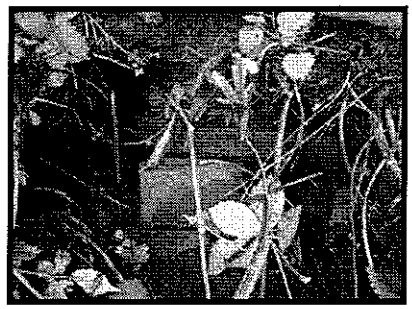


Photo 10 Sink – Possible Point where Surface Runoff from the Field Leave the Site

4. Outline Drainage Strategy

4.1 Surface Water Drainage

The standard requirement for surface water drainage design on a Greenfield site is for the anticipated Surface Water Run-off Rates from the proposed development to be limited to the existing 1 in 1 year Greenfield Run-off Rate, up to and including the 1 in 100 Year Rainfall Event, plus an allowance for climate change.

Limiting the anticipated Surface Water Run-off from the site to a level which is equivalent to the Greenfield runoff rate for the site, will ensure that the there are no detrimental effects downstream of the site.

4.1.1 Baseline (Greenfield) Runoff Rates

Following discussions between AMEC and the Environment Agency (EA) during the preparation of the FRA Report for the site, it was agreed that a Greenfield Runoff Rate of 10 Litres per second per hectare (l/s/ha) should be adopted to assess the anticipated Surface Water Run-offs.

4.1.2 Anticipated Surface Water Runoffs

The anticipated volumes of Surface Water Run-off from the proposed development, for both the 1 in 30 Year and the 1 in 100 Year Rainfall Events, have been assessed using the WinDes Micro Drainage Hydraulic Modelling software. The design module using Micro Drainage WinDes Simulation has been used to assess the extent of the storage needed to attenuate the 100-Year Rainfall Event, including a 30% increase for climate change. A skeletal Hydraulic Model was developed by AMEC for this assessment as shown on Drawing No. 29421_CVD_N_109B.

The results show that the management of the anticipated Surface Water Runoff from the proposed development will require the provision of adequate on-site storage facilities in accordance with the stipulations in the Technical Guidance to the National Planning Policy Framework (NPPF). The extent of the storage requirement for the proposed development is as shown in table 4.1 below.

Table 4.1 Extent of Surface Water Storage Requirements

Rainfall Event	Surface Water Storage Requirement
1 in 100 Year Rainfall	185m3 (Option 1: using Sub Surface Storage) 540m3 (Option 2: using Attenuation Pond Storage)
1 in 30 Year Rainfall	86m3 (Option 1: using Sub Surface Storage) 302m3 (Option 2: using Attenuation Pond Storage)

4.1.3 Design Philosophy

The presence of natural surface water drainage features lends the site prime for a Sustainable Urban Drainage System (SUDS) Approach in the general management of the anticipated

Surface Water Runoff from the proposed development. The design philosophy adopted for this hydraulic assessment has been summarized below:

- The Hydraulic Model developed for this aspect of the work had a restriction to limit anticipated Surface Water Run-off to a value equivalent to the Green Field Runoff Rate of 10 liters per second per hectare (l/s/ha);
- All Surface Water Run-offs from the proposed development will be restricted to the existing Greenfield Runoff Rate, to ensure that there's no flooding downstream as a result of the development;
- Anticipated Surface Water Run-off from the proposed development will be managed on site either via a network of Subsurface Storage Structures (Flexible Paving) or Attenuation Pond;
- The Subsurface Storage will be sized to accommodate the anticipated Surface Water Run-off;
- Surface water runoff from the network of Subsurface Storage Structures/or Attenuation Pond has been assessed to discharge into the existing Private Surface Water Drain via a number of Outfall Points, as shown on Drawing No. 29421_N_CVD_109B;
- Flow Control Structures (Hydro-Brakes) would be used to control the anticipated Surface Water Run-offs from the proposed development, to ensure that they are maintained at the Greenfield Runoff Rate. This would be assessed at Detailed Design stage;
- The highways are proposed to drain directly to the Subsurface Storage Structures through Permeable Surface Features;
- All driveways and rainwater pipes are to be connected directly into the Subsurface Storage Structures; and
- The type of Permeable Paving proposed would need to be confirmed at Reserve Matters/ Detailed Design Stage subject to the completion of suitable Soakaway Tests.

Any residual Surface Water Run-off can drain off site via the existing watercourses, as long as the flows are restricted to the existing Greenfield Runoff Rate so as to not increase flooding downstream of the proposed development.

4.1.4 Options for Managing Anticipated Surface Water Runoffs

In this Outline Strategy, we have assessed several options for dealing with anticipated Surface Water Run-offs from the proposed development. The preferred option which has been selected moving forward, offers the best solution from a Sustainable Urban Drainage (SuDS) perspective and this is described below:

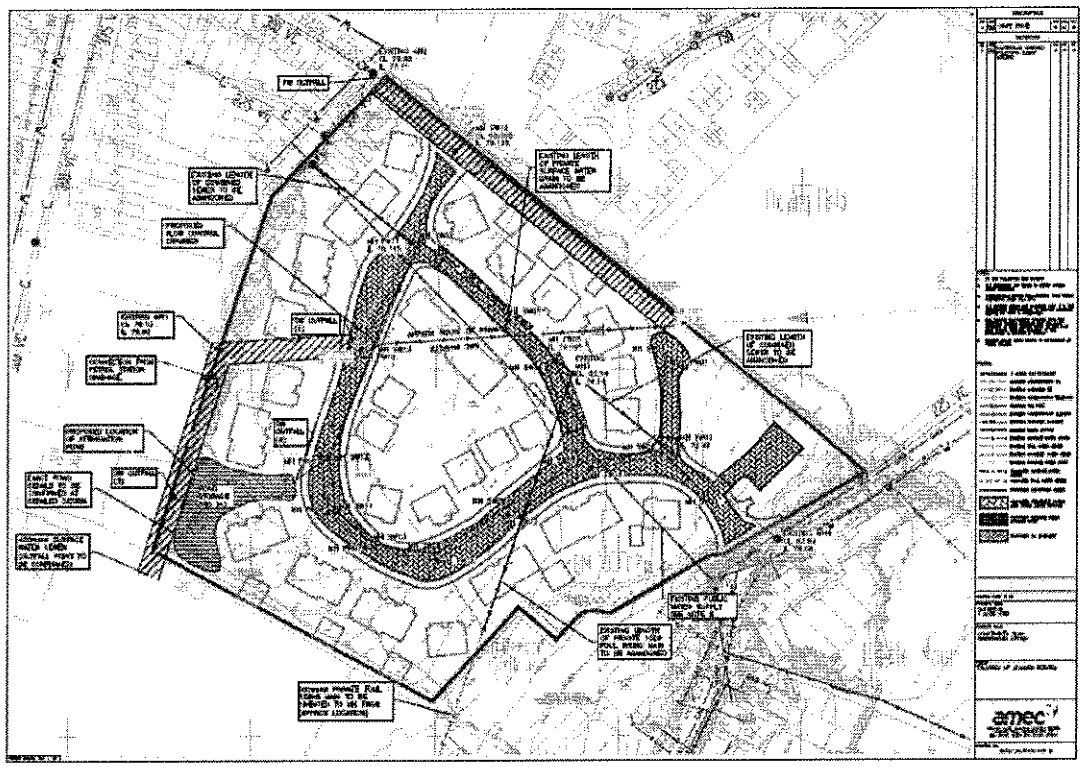
Preferred Surface Water Drainage Option – Subsurface Drainage with Attenuation Pond

This option should be read in conjunction with Drawing No. 29421_N_CVD_109B. It involves the provision of a subsurface drainage system located on the access roads, together with an Attenuation Pond (to be located on the south western corner of the site, believed to be the lowest spot from the topographical survey). At normal low flows, the anticipated surface runoffs

would be managed by the network of Permeable Paving designed to slow down the surface water flows. The anticipated Surface Water Run-offs would then be discharged off site via an outfall located at a new Manhole Ref: PW03, located along the line of the existing Private Surface Water Drain crossing the site.

At higher flows, the anticipated Surface Water Run-offs would overflow into the Attenuation Pond. The Attenuation Pond has been assessed to provide a storage capacity of 540m^3, which is the volume of water expected to be generated during a 1 in 100 Year Rainfall Event. Any overspill greater than the capacity of the Attenuation Pond would eventually discharge into the downstream section of the existing Private Water Drain at Whalley Road, via a new Surface Water Outfall No. 3. The current combined storage capacity requirement is 725m^3. (Proposed capacity of the Attenuation Pond is 540m^3; the proposed storage capacity of the Permeable Paving is 185m^3).

Figure 3 Constraints Plan, Preferred Drainage Option



The following considerations must be given should this proposed surface water drainage option be adopted moving forward:

- Connection into the existing Private Water Drain is presently outside the remit of UU. There will be a requirement to confirm the ownership of this Private Water Drain prior to making any connection to it. A document entitled "Living on the Edge 4th Edition" published by the Environment Agency, states that the owner of land or property next to a river, stream or ditch is classed as a "Riparian

Landowner". The document defines the "Rights and Responsibilities" of the Riparian Owner;

- From the current Illustrative Masterplan provided to AMEC for this work, there will be a need to divert some sections of existing services currently crossing the site. The possible diversions have been identified on the Constraints Plan produced by AMEC. Any diversion of existing services crossing the site (Water, Combined Sewer, Surface Water etc) will require approval from the relevant Statutory Undertakers at Reserve Matters/ Detailed Design Stage;
- Existing low spots within the site where water might pond should be avoided by careful re-profiling of the ground to allow overland flows to drain away from the buildings and safely discharge to the proposed storage features without causing increased flood risk elsewhere. This may require some raised shallow bunds to convey water to the storage features and prevent the water leaving the site in an uncontrolled manner.

4.2 Foul Drainage

Anticipated foul flows from the proposed development have been assessed in accordance with the stipulations in Sewers for Adoption 6th Edition. A copy of the calculations is contained in Appendix H of this report.

The estimated anticipated foul flow from the proposed development is approximately 2 5 l/s (Litres per second). There is presently a 225mm (noted as 300mm diameter on UU's public sewer records) Public Combined Sewer crossing the proposed development site.

Note that the existing Combined Public Sewer crossing the site, will require a 6m wide easement, over which there can be no development. The housing layout will need to accommodate this easement.

The estimated pipe capacity of the 225mm diameter Public Combined Sewer crossing the development site is 43 l/s at an approximate hydraulic gradient of 1 in 112, compared to the anticipated foul flow from the proposed development of 2.5 l/s. Although this sewer appears presently to be catering for off site discharge of sewerage for a large catchment area upstream of the site, it would appear that the catchment for the 225mm diameter Public Combined Sewer is more of a rural nature. We therefore expect that this section of the combined public sewer network to have sufficient capacity to accommodate the anticipated foul flows from the proposed development. The proposed connection points into the public sewer network from the development are as shown on the Constraints Plan, Drawing No. 29421_N_CVD_109B.

Potential diversions of the Public Combined Sewer have been identified on the Constraints Plan produced by AMEC. Any diversion of existing Public Sewers would require approval from the relevant Statutory Undertaker, UU at Reserve Matters/ Detailed Design Stage.

Formal approval will also be required from UU to connect foul flows into this section of the public sewer.

5. Conclusions

5.1 Surface Water Flow

Drainage calculations undertaken by AMEC show that there will be a requirement for attenuation to reduce the peak surface water runoff rate to the existing Greenfield runoff rate. These measures would ensure that the potential increase in impermeable areas arising from the proposed development does not increase the potential flood risk associated with the anticipated surface water runoff.

The existing characteristics of the site (sloping topography from north east to south west, Culverted Watercourse, Open Watercourse downstream of the site) make it possible to incorporate a combination of the SUDS Structures (Permeable Paving and Attenuation Pond), into the management of the anticipated Surface Water Run-off from the site.

The assessment undertaken by AMEC shows that the anticipated Surface Water Run-off from the proposed development can be safely managed within the site boundary

The current combined storage capacity requirement is 725m^3. (Proposed capacity of the Attenuation Pond is 540m^3; the proposed storage capacity of the Permeable Paving is 185m^3).

5.2 Foul Flows

With regards to foul drainage, our calculations show that the anticipated Foul Flow from the proposed development is approximately 2.5 l/s.

Our calculations also show that the existing Public Combined Sewer crossing the site should have sufficient capacity to accommodate the anticipated Foul Flows from the proposed development. The proposed connection points into the public sewer network from the development are as shown on the Constraints Plan, Drawing No. 29421_N_CVD_109B.

Formal approval to connect into the existing Public Combined Sewer will be required from United Utilities prior to Reserve Matters/ Detailed Design Stage.

The existing Public Combined Public Sewer crossing the site will require a 6m wide easement, over which there can be no development. The housing layout will need to accommodate this easement.

6. Recommendations

6.1 Recommendations

The following works are recommended to be undertaken prior to Reserve Matters/ Detailed Design Stage:

- A CCTV Survey of the existing surface water drain has confirmed that sections of this drain contained fairly high percentage of debris/ possible pipe collapse, leading to flow restrictions. Further investigations of the drainage network will be required before it can be fully utilised. Connection into the existing Private Water Drain is presently outside the remit of UU and confirmation of ownership will be required. There will be a requirement to confirm the ownership of this Private Water Drain prior to making any connection to it. A document entitled "Living on the Edge 4th Edition" published by the Environment Agency, states that the owner of land or property next to a river, stream or ditch is classed as a "Riparian Landowner". The document defines the "Rights and Responsibilities" of the Riparian Owner;
- From the current Illustrative Masterplan provided to AMEC for this work, there will be a need to divert some sections of existing services currently crossing the site. The possible diversions have been identified on the Constraints Plan produced by AMEC. Any diversion of existing services crossing the site (Water, Combined Sewer, Surface Water etc.) will require approval from the relevant Statutory Undertakers at Reserve Matters/ Detailed Design Stage;
- Existing low spots within the site where water might pond should be avoided by careful re-profiling of the ground to allow overland flows to drain away from the buildings and safely discharge to the proposed storage features without causing increased flood risk elsewhere. This may require some raised shallow bunds to convey water to the storage features and prevent the water leaving the site in an uncontrolled manner;
- The Envirocheck Report11 presents BGS groundwater flooding susceptibility maps and shows the site to have a moderately high susceptibility over the large majority of the area. The area is known to be underlain by Limestone which is fairly permeable; however the WRAP map and FEH CD ROM suggest that the soils have a low permeability which would act as a barrier to rising groundwater. This low soil permeability, coupled with a high Annual Rainfall (SAAR of 1274mm) means that surface water only drains away at a slow rate, resulting in Ponding. There will therefore be a need to undertake Soakaway Tests at sufficient locations to understand the drainage characteristics of the existing soil on the site, prior to detailed design of SUDS structures;
- Further investigation is required to confirm the nature, source, and true alignment of the existing Culverted Watercourse, prior to Detailed Design Stage; and
- Formal liaison will be necessary with the Environment Agency (EA) at Detailed Design Stage with respect to surface water discharge from the site. There will also be a requirement to seek formal approval from the Local Authority for the

discharge of surface water into the ditches/watercourse if they are considered to be Non-Main Rivers.

7. References

- Sewers for Adoption- A Design & Construction Guide for Developers, 6th Edition (March 2006) – Water Research Centre plc.
- Services Study Report for the 4 Acre Site located between Littlemoor and Whalley Road, Clitheroe, Lancashire - issued by AMEC in April 2012, reference: N028i2.
- Flood Risk Assessment Report for the proposed construction of 49 Residential Units at the 4 Acre Site located between Littlemoor and Whalley Road, Clitheroe, Lancashire - issued by AMEC in April 2012.
- Environment Agency, 2011. "What's In My Backyard" website, Flood risk from reservoirs:(http://maps.environmentagency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e).
- Technical Guidance to the National Planning Policy Framework. London: HMSO 2012.
- British Geological Survey (BGS) DiGMapGB-625 data 1:625,000.
- CIRIA. The SUDS Manual, C697 2007.
- Landmark Information Group. Envirocheck Report. Flood Screening Report Datasheet. 2012.

Appendix A
Copy of Current Illustrative Masterplan

October 2012
Doc Reg No. 29421


Playing Field
Little H

Appendix B
Copy of United Utilities' (UU) Letter Dated 10th August 2012.

7074
SW

United Utilities Water PLC
Developer Services & Planning
Thirlmere House
Lingley Mere Business Park
Lingley Green Avenue
Great Sankey
Warrington WA5 3LP

Telephone 01925 678307
Planning liaison@uuplc.co.uk

Ribble Valley Borough Council
Council Officers, Church Walk
Clitheroe
BB7 2RA

Your ref: 3/2012/0420
Our ref: DC/12/2376
Date: 10-AUG-12

Dear Sir/Madam

Location: Land North and West of Littlemoor Clitheroe Lancashire
Proposal: Outline Application for a Residential Development

With reference to the above planning application,

Recent investigations have confirmed that the sewer network serving the area is nearing capacity. To ensure that there is a consistent & fair approach taken by United Utilities we would ask that all development applications include an indicative layout plan, a schedule showing the type of housing to be built, a program of works showing build rates, a Load & Flow impact assessment, preferred discharge points and proposed rates of flow for each discharge point so that United Utilities can determine the full impact that the development has on our assets Therefore United Utilities will object to the application pending the submission of the additional information.

Our water mains will need extending to serve any development on this site The applicant, who may be required to pay a capital contribution, will need to sign an Agreement under Sections 41, 42 & 43 of the Water Industry Act 1991.

United Utilities offer a fully supported mapping service at a modest cost for our water mains and sewerage assets. This is a service, which is constantly updated by our Property Searches Team (Tel No: 0870 7510101) It is the applicant's responsibility to demonstrate the exact relationship between any assets that may cross the site and any proposed development

Please note, due to the public sewer transfer, not all sewers are currently shown on the statutory sewer records, if a sewer is discovered during construction, please contact a Building Control Body to discuss the matter further

Yours Faithfully,

Daniel McDermott
Developer Services & Asset Protection
United Utilities

Appendix C
Copy of Email Correspondence between AMEC and Graham Perry (United Utilities)

October 2012
Doc Reg No 29421

"Perry, Graham" <Graham.Perry@uuplc.co.uk>

06/09/2012 13:10

To: <sammy.spaine@amec.com>,
cc: Richard Percy <richardp@abbott-associates.co.uk>, John Hall <john.hall3@amec.com>, Chris Prydderch <chris.prydderch@amec.com>
Subject: RE: Clitheroe - 4 Acre Site: Proposed Development

Hello Sammy

I would agree that the below is a true reflection of our discussion however the letter from John Lunt was I believe dated 30/08 2011 which is over 12 months ago.

I can also confirm that the Ross officer who will authorize access into the sewer is Emily Astbridge who can be contacted by the following e-mail Emily.Asbridge@uuplc.co.uk

Thanks

Graham Perry

From: sammy.spaine@amec.com [mailto:sammy.spaine@amec.com]
Sent: 06 September 2012 09:58
To: Perry, Graham
Cc: Richard Percy; John Hall; Chris Prydderch
Subject: Clitheroe - 4 Acre Site: Proposed Development

Graham,

I refer to our telephone conversation of yesterday's date regarding the above, and in particular the letter from your Mr. Daniel McDermott dated 10th August 2012. (copy attached).

Please find below my summary of our telephone conversation as agreed:

- An Approval-In-Principle was previously granted by UU via email sent from John Lunt dated 30.08.2012.
- The attached letter superseding the aforementioned email, has been sent out by UU on the basis of the many planning applications for new developments within the catchment which have been submitted over the past twelve months.
- UU are concerned that their current infrastructure may not have sufficient capacity to serve all the proposed development currently up for planning.
- In this regard, UU are now requesting that an Outline Drainage Strategy be submitted consisting of the following information:

1. An estimation of the anticipated foul flows and surface run-offs from the proposed development.
2. Surface Run-offs to be assessed on the basis of the Greenfield Run-off Rate for the catchment.
3. Identification of the proposed discharge outfalls.
4. A Masterplan showing details of the house types being proposed including the Phasing (Programming) of the development.
5. A "Constraints Plan" consisting of current topographical survey data, superimposed over the current Masterplan, merged with the existing sewer information would be suitable at this stage. This plan would also contain the discharge points, together with the values of the anticipated flows. (Foul & Surface Water)

- UU will plug the above information into their current Hydraulic Model for the catchment, to assess

the true impact of this development on their infrastructure.

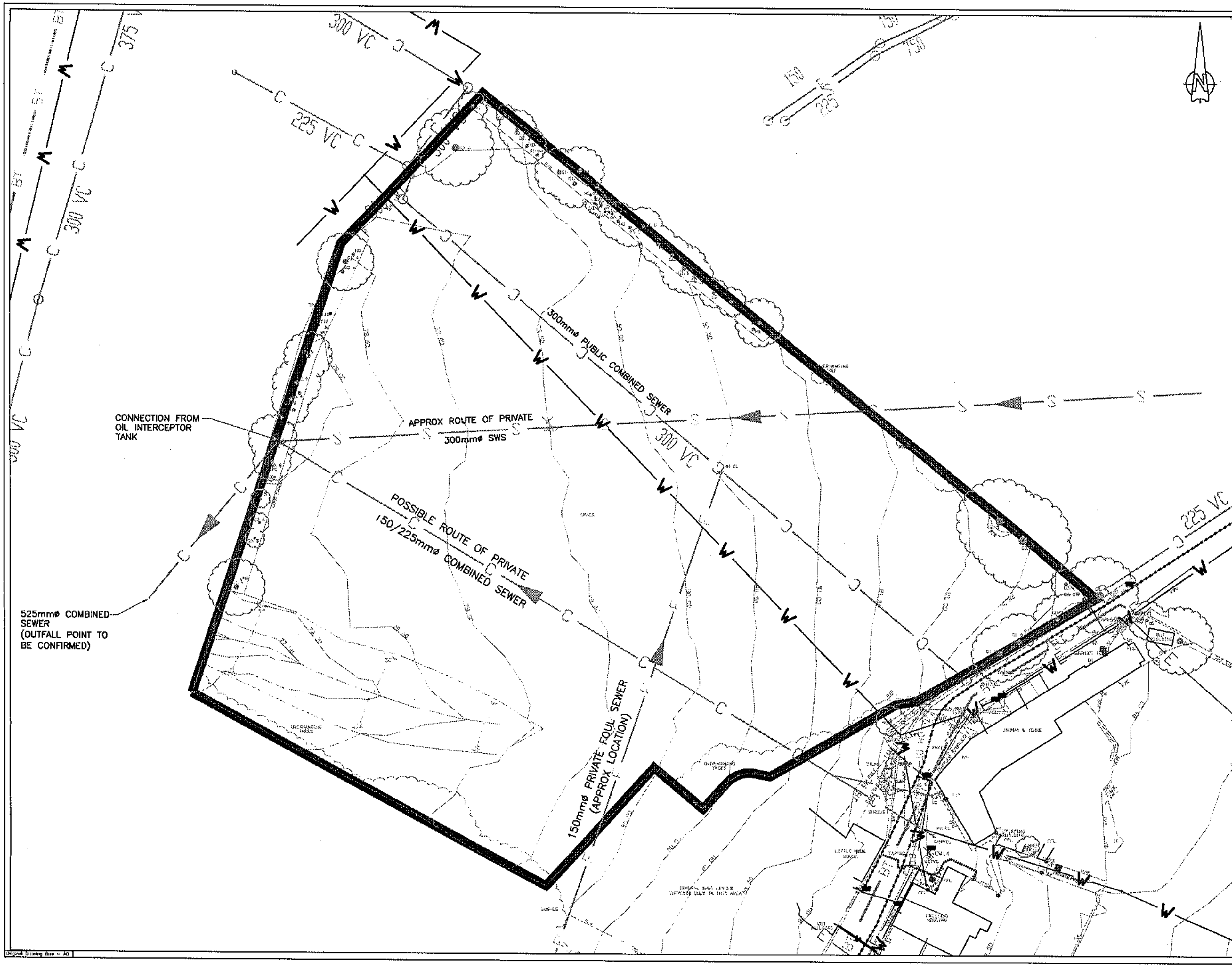
- The flows and discharge points identified would then be used to define the final Planning Conditions;
- An old copy of the sewer records show a combined Public Sewer, together with a Culverted Watercourse crossing the site. There's a need to undertake a survey of these sections of sewer crossing the site, and to identify any other uncharted sewers within the footprint of the proposed development. AMEC will be required to liaise with the ROSS officer at UU to obtain permission to work within their network. Graham will forward the contact details of their ROSS officer to me via email asap.

I trust the above is a true representation of what was discussed and agreed.

Regards
Sammy Spaine BEng Hons, CEng MICE, AMAE, APMP
Technical Director
AMEC
Environment and Infrastructure UK Ltd
Windsor House, Gadbrook Business Centre, Northwich Cheshire CW9 7TN UK
Tel +44 (0) 01606 354800, Fax +44(0) 01606 354810
Direct +44 (0)01606 354842 mobile/cell 07803 078418
mailto:sammy.spaine@amec.com
amec.com

Appendix D
Drawing No. 29421_N_CVD_107

October 2012
Doc Reg No 29421



REV	DATE	DESCRIPTION	DRN	CHK	APP
A		DRAFT ISSUE			

REVISIONS

NOTES:

1. DO NOT SCALE FROM THIS DRAWING
2. ALL DIMENSIONS AND LEVELS IN METRES UNLESS NOTED OTHERWISE
3. TOPOGRAPHICAL SURVEY DATA OBTAINED FROM SURVEY OPERATIONS, DATED JULY 2011.
4. ALL SERVICES SHOWN ARE INDICATIVE ONLY. IT IS THE CONTRACTORS RESPONSIBILITY TO CONFIRM LOCATIONS BEFORE ANY WORK IS UNDERTAKEN.
5. THE SERVICES INFORMATION OBTAINED FROM THE STATUTORY SERVICE PROVIDERS HAS NOT BEEN VALIDATED BY AMEC. FUTURE USERS OF THIS PLAN MUST ENSURE THAT THE ACCURACY OF THE INFORMATION IS CHECKED & PROVEN.

LEGEND:

- 4 ACRES SITE BOUNDARY
- EXISTING UNDERGROUND BT
- EXISTING OVERHEAD BT
- EXISTING UNDERGROUND TELECOMS
- EXISTING GAS PIPE
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING WATER SUPPLY
- EXISTING SURFACE WATER SEWER
- EXISTING FOUL WATER SEWER
- EXISTING COMBINED WATER SEWER

DRAFT

SCALE: 1:250 @ A0

PROJECT TITLE: CLITHEROE 4 ACRE SITE

DRAWING TITLE: APPROXIMATE LOCATION OF EXISTING SERVICES

CLIENT: TRUSTEES OF STANDEN ESTATES

amec

DRAWING No. 29421/N/CV0/107/A

Original Drawing Size — A0

Appendix E
Copy of Correspondence between AMEC and the Environment Agency

October 2012
Doc Reg No. 29421

Dawson, Emily

From: Worswick, Colin
Sent: 03 April 2012 10:33
To: NW North Preston, Information Requests
Subject: PRE3187_DFR 31936 - Land at Higher Standon, Clitheroe - FRA

Colin Worswick

Development and Flood Risk Engineer
North Area, North West Region
01772 714259
07741 019565

From: Worswick, Colin
Sent: 22 March 2012 10:02
To: 'stewart.griffiths@amec.com'
Subject: RE: 31936 - Land at Higher Standon, Clitheroe - FRA

Stewart,

I can confirm that both sites lie within Flood Zone 1. We are not aware of any flooding incidents, however you are advised to contact Ribble Valley Borough Council who may have more detailed local records. Surface water run-off must be restricted to existing greenfield rates which is 10l/s/hectare. You will require Flood Defence Consent to culvert or divert any watercourses.

Regards

Colin Worswick

Development and Flood Risk Engineer
North Area, North West Region
01772 714259
07741 019565

From: stewart.griffiths@amec.com [mailto:stewart.griffiths@amec.com]
Sent: 20 March 2012 14:28
To: Worswick, Colin
Subject: 31936 - Land at Higher Standon, Clitheroe - FRA

FAO: Colin Worswick

I understand that you cover the Clitheroe Area.

We are undertaking a Flood Risk Assessment for a couple of development sites in Clitheroe - see attached layout plan(s).

a) **Site 1 - 4 Acre Site**(Post Code BB7 1HF)

The site is located between Little Moor and Little Moor View as indicated by the attached plan.

b) **Site 2 - Main Development Site**(covering an area of approx 70 ha)

Located to the east of Little Moor Road, as indicated on the Drawing.

Could you advise me whether there are any flooding restrictions on this site, for our inclusion in our Flood Risk Assessment Report?
We understand that the site is located in a Flood Zone 1 Area, but could you confirm this.

Any queries then contact me on the number below.

Regards

Stewart Griffiths
Senior Civil Engineer
AMEC
Amec Environment & Infrastructure UK Limited
Windsor House, Gadbrook Road, Northwich CW9 7TN UK
Tel +99 (0)1606 354800
Direct +44 (0)1606 354812 mobile +44(0)7896 213922
stewart.griffiths@amec.com
amec.com/ukenvironment

----- Forwarded by Stewart Griffiths/NOR/ENTEC/NWG on 20/03/2012 14:03 -----

From:	"Welsby, Cliff" <cliff.welsby@environment-agency.gov.uk>
To:	"stewart.griffiths@amec.com <stewart.griffiths@amec.com>
Date:	15/03/2012 12:15
Subject:	RE: 31936 - Land at Higher Standon, Clitheroe - FRA

Stewart.

Colin Worswick is the engineer for Clitheroe area.

Tel. 07741 019565

Cliff.

From: stewart.griffiths@amec.com [mailto:stewart.griffiths@amec.com]
Sent: 14 March 2012 10:08
To: Welsby, Cliff
Cc: Carter, Philip A; andrew.worsdale@amec.com
Subject: 31936 - Land at Higher Standon, Clitheroe - FRA

Hi Cliff,

We have a couple of Greenfield sites in Clitheroe where we have been asked to undertake an Outline FRA.

Who is the EA contact for this area?

Regards

Stewart Griffiths
Senior Civil Engineer
AMEC
Amec Environment & Infrastructure UK Limited
Windsor House, Gadbrook Road, Northwich CW9 7TN, UK
Tel +99 (0)1606 354800
Direct +44 (0)1606 354812 mobile +44(0)7896 213922
stewart.griffiths@amec.com
amec.com/ukenvironment

From:	'Welsby, Cliff" <cliff welsby@environment-agency gov uk>
To:	'stewart griffiths@amec com" <stewart griffiths@amec com>
Cc:	Carter, Philip A" <PCARTER@environment-agency gov uk>
Date:	07/03/2012 10:28
Subject:	RE: 31936 - Site at Lightfoot Lane Fulwood, Preston - FRA

Stewart.

As detailed by Philip on site attenuation will be required for surface water at existing "green field" rates usually considered to be 10l/sec/hec
Any works to the culverted watercourse may require Agency formal consent.
Please contact me again should you need to apply for any consents.

Regards

Cliff.

From: stewart.griffiths@amec.com [mailto:stewart.griffiths@amec.com]
Sent: 07 March 2012 09:59

To: Welsby, Cliff
Cc: andrew.worsdale@amec.com; sammy.spaine@amec.com
Subject: 31936 - Site at Lightfoot Lane, Fulwood, Preston - FRA

Cliff,

Further to Phil Carter's e:mail below, are you aware of any site specific issues for the site at Lightfoot Lane (location plan attached) which will need to be included in the FRA?

Many Thanks

Stewart Griffiths
Senior Civil Engineer
AMEC
Amec Environment & Infrastructure UK Limited
Windsor House, Gadbrook Road, Northwich CW9 7TN, UK
Tel +99 (0)1606 354800
Direct +44 (0)1606 354812 mobile +44(0)7896 213922
stewart.griffiths@amec.com
amec.com/ukenvironment

----- Forwarded by Stewart Griffiths/NOR/ENTEC/NWG on 07/03/2012 09:53 -----

From:	"Carter Philip A" <PCARTER@environment-agency gov uk>
To:	"stewart griffiths@amec com" <stewart griffiths@amec com>
Cc:	"Welsby Cliff" <cliff welsby@environment-agency gov uk>
Date:	07/03/2012 09:47
Subject:	RE: 31936 - Site at Lightfoot Lane Fulwood Preston - FRA

Stewart

The engineer who covers the area is Cliff Welsby - you can contact him directly on 01772 714016 but I've also copied him into this e-mail.

I can confirm that the area is Flood Zone 1 and any development must ensure that surface water run-off from the site is restricted to existing rates (to be identified in the FRA). From the OS map of the area, there is an ordinary watercourse flowing through the site in a northerly direction, under the motorway, in culvert. The risk of flooding due to blockage or under capacity of the watercourses and culverts on site will need to be considered in the FRA, as will the potential for removal of any culverts that could reduce flood risk.

I would recommend contacting Cliff to see if he has any other site specific issues that would need to be considered in the FRA Kind regards

Philip

Philip Carter
Planning Liaison Officer
Environment Agency
PO Box 519
South Preston
PR5 8GD
01772 714219

Flooding data Request - Standen Road, Clitheroe

Finch, Peter to richard.breakspear 14/02/2012 14:42

Richard,

Thank you for your Email dated 13th February 2012.

There are no major recorded flooding incidents on Standen Road, except for the occasional blocked gully that can cause a localised flooding problem.

Regards
Peter Finch
Principal Engineer (Ribble Valley)
Environment Services East
Lancashire County Council
01254 770960

RE: Sewer flooding data request , site at Standen, Clitheroe, Lancashire

Planning Liaison to richard.breakspear 20/02/2012 12:23

Hello Richard

Information as requested

DG5 Sewer Flooding

I have checked our records and have found a DG5 flooding issues within the immediate vicinity of the proposed development. The reported issue is on Turner Street, Clitheroe.

Please note that United Utilities Water plc (UUW) can only record and check flooding events which are reported to us and we have to comply with our Regulators instructions on the qualification of flooding events to place on the 'at risk' register.

This assesment does not include any sewer flooding events caused by blockages or collapses which are the result of third party actions, natural events or other actions over which UUW has no control and not a facet of sewer capacity.

If I can be of any further assistance in the meantime then please don't hesitate to get in touch.
Regards
Graham Perry

From: richard.breakspear@amec.com [mailto:richard.breakspear@amec.com]
Sent: 13 February 2012 10:15
To: Planning Liaison
Subject: Sewer flooding data request, site at Standen, Clitheroe, Lancashire

Hi,

I would like to request information on past/existing incidences of sewer flooding in support of a Flood Risk Assessment being prepared for a residential development site at Standen, Clitheroe, Lancashire.

I've checked on your website, under Developer Enquiries (http://www.unitedutilities.com/Wastewaterconnections.aspx) and cannot find a link to the information I require.

The site is immediately west of the A59, (see attached plan). The approximate grid reference for the centre of the area of interest is: SD 74917 40684
Or see:
http://gridreferencefinder.com/?gr=SD7491740684%7CPoint_s_E%7C0&z=15&v=h&t=Point_s_E

Best regards,

Richard

Dr Richard Breakspear

Dawson, Emily

From: Griffiths, Stewart on behalf of Dawson, Emily
Sent: 26 March 2012 10:13
To: Dawson, Emily
Subject: 29421 - Land at Higher Standon, Clitheroe, Lancs

Note the response I received from UU last week, for your information.

Regards

Stewart Griffiths
Senior Civil Engineer
AMEC
Amec Environment & Infrastructure UK Limited Windsor House, Gadbrook Road, Northwich CW9 7TN, UK Tel +99 (0)1606 354800 Direct +44 (0)1606 354812 mobile +44(0)7896 213922 stewart griffiths@amec.com
amec.com/ukenvironment

----- Forwarded by Stewart Griffiths/NOR/ENTEC/NWG on 26/03/2012 10:13

|----------->
| From: |
|----------->
>----------|
|"Perry, Graham" <Graham.Perry@uuplc.co.uk> |
>----------|
|----------->
| To: |
|----------->
>----------|
|<stewart.griffiths@amec.com> |
>----------|
|----------->
| Date: |
|----------->
>----------|
|19/03/2012 16:21 |
>----------|
|----------->
| Subject: |
|----------->
>----------|
|RE: 29421 - Land at Higher Standon, Clitheroe, Lancs |
>----------|

Hello Stewart

Further to our discussion, I can confirm that we would accept free foul discharge from 50 domestic units into the 300mm combined sewer crossing the site but we would not accept any surface water. Under the terms of Building regulation H3 & PPS25, you must discharge to either soakaway on site or to the nearby watercourse.

We would have no objection to you diverting the existing 300mm combined sewer that crosses the site providing that you enter into a Section 185 Diversion agreement before starting.

"United Utilities Water plc (UUW) will provide information on connection points and maximum permitted discharge rates to public sewers in response to enquiries by developers and in response to Planning Applications where Planning Authorities have elected to consult UUW on drainage matters.

However, the points of connection and discharge rates cannot be allocated and reserved for a particular development. UUW reserves the right to revise the connection point and discharge rate current at the time that a formal application for connection to public sewer is made, in order to take account of possible changes in discharges to the public sewer between the date of the enquiry and the date of the connection being required".

Regards

Graham Perry

From: stewart.griffiths@amec.com [mailto:stewart griffiths@amec.com]
Sent: 13 March 2012 13:17
To: Perry, Graham
Subject: 29421 - Land at Higher Standon, Clitheroe, Lancs

Graham,

FYI

I don't think you received this drawing last time!

Regards

Stewart Griffiths
Senior Civil Engineer
AMEC
Amec Environment & Infrastructure UK Limited Windsor House, Gadbrook Road, Northwich CW9 7TN, UK Tel +99 (0)1606 354800 Direct +44 (0)1606 354812 mobile +44(0)7896 213922 stewart.griffiths@amec.com
amec.com/ukenvironment

----- Forwarded by Stewart Griffiths/NOR/ENTEC/NWG on 13/03/2012 13:20

From: Stewart Griffiths/NOR/ENTEC/NWG

To: "Perry, Graham" <Graham.Perry@uuplc.co.uk>

Date: 13/03/2012 13:09

Subject: 29421 - Land at Higher Standon, Clitheroe, Lancs

Hello Stewart,

My initial thoughts would be that this is a significant development that will have a major impact to our network and receiving treatment works.

Surface Water

All surface water from this site must be drained directly soakaway / SUDS or to the watercourses running through the site. You will need to discuss your proposals with the EA to agree discharge points / flow rates

Foul

We are currently carrying out a detailed assessment of the area and we should know the impact that your site has to our assets in the near future.
For your purposes I would suggest that will be capacity issues on the network & treatment works.

Regards

Graham Perry

From: stewart.griffiths@amec.com [mailto:stewart.griffiths@amec.com]
Sent: 05 January 2012 16:34
To: Perry, Graham
Subject: 29421 - Land at Higher Standon, Clitheroe, Lancs

Hi Graham,

Happy New Year!

We have a site in your area which we are assessing from a drainage capacity point of view.

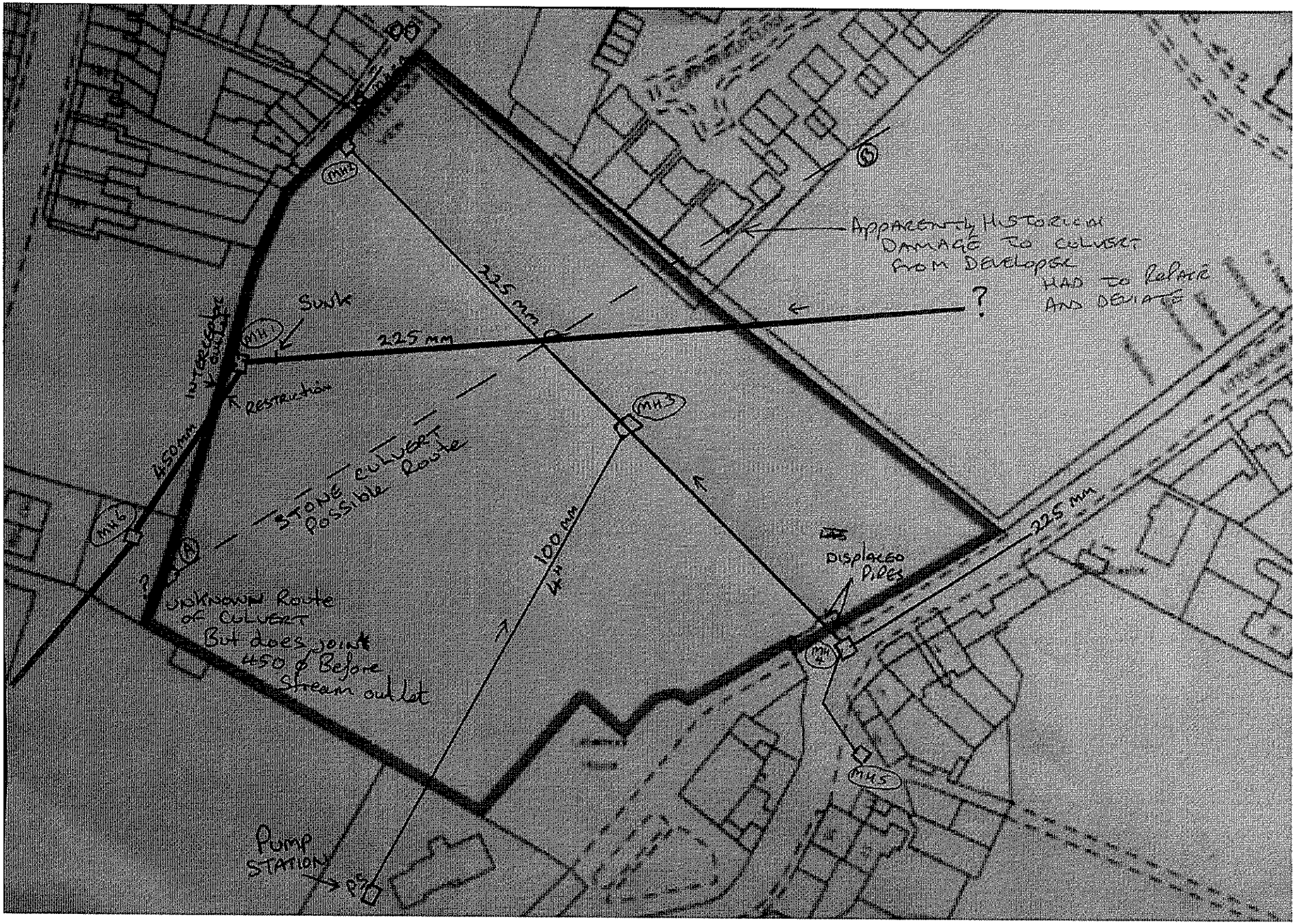
The location of the site is attached (Postcode BB7 1PP) for your information, which is located to the South East of Clitheroe.

We are in the process of requesting Sewer Record information from UU

Anticipated development will consist of approx 1040 residential properties and 7500 m2 of office space

Could you advise me on the capacity of the local sewerage systems to accommodate such a development?

Appendix F
Copy of Marked-up Site Survey Plan


MH2
MH1
MH3
MH4
MH5
MH6
Sunk
225 mm
225 mm
225 mm
450mm
100 mm
Apparently Historical Damage to Culvert from Developer had to Repair and Deviate
?
Displaced Pipes
Stone Culvert Possible Route
Unknown Route of Culvert But does join 450 ø Before Stream outlet
Pump Station
PS

Appendix G
Calculations – Proposed Surface Water Sewers

October 2012
Doc Reg No. 29421

Existing Network Details for Storm

* - Indicates pipe has been modified outside of System 1

	PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T E. (mins)	k (mm)	HYD SECT	DIA (mm)
*	1.000	29.833	0.195	153.0	0.050	5.00	0.600	o	225
*	1.001	30.463	0.202	150.8	0.144	0.00	0.600	o	225
*	2.000	17.692	0.246	71.9	0.042	5.00	0.600	o	225
*	3.000	26.019	0.171	152.2	0.036	5.00	0.600	o	225
*	2.001	22.361	1.454	15.4	0.050	0.00	0.600	o	225
*	4.000	28.460	0.050	569.2	0.025	5.00	0.600	o	225
*	2.002	22.825	0.164	139.2	0.029	0.00	0.600	o	225
*	2.003	23.022	0.166	138.7	0.069	0.00	0.600	o	225
*	2.004	17.117	0.123	139.2	0.081	0.00	0.600	o	225
*	2.005	14.142	0.102	138.6	0.088	0.00	0.600	o	300
*	2.006	14.142	0.102	138.6	0.070	0.00	0.600	o	300
*	2.007	33.242	0.240	138.5	0.067	0.00	0.600	o	300
*	1.002	5.000	0.338	14.8	0.139	0.00	0.600	o	300
*	1.003	36.125	0.965	37.4	0.000	0.00	0.600	o	450

	PN	US/MH Name	US/CL (m)	US/IL (m)	US C	US Depth (m)	DS/CL (m)	DS/IL (m)	DS C	DS Depth (m)	Ctrl	US/MH (mm)
*	1.000	SW01	79.800	78.375		1.200	79.500	78.180		1.095		1200
*	1.001	SW02	79.500	78.180		1.095	78.800	77.978		0.597		1200
*	2.000	SW03	82.000	80.575		1.200	81.700	80.329		1.146		1200
*	3.000	SW04	81.700	80.500		0.975	81.700	80.329		1.146		1200
*	2.001	SW05	81.700	80.329		1.146	80.500	78.875		1.400		1200
*	4.000	SW06	80.300	78.925		1.150	80.500	78.875		1.400		1200
*	2.002	SW07	80.500	78.875		1.400	79.800	78.711		0.864		1200
*	2.003	SW08	79.800	78.711		0.864	79.800	78.545		1.030		1200
*	2.004	SW09	79.800	78.545		1.030	79.000	78.422		0.353		1200
*	2.005	SW10	79.000	78.347		0.353	79.000	78.245		0.455		1200
*	2.006	SW11	79.000	78.245		0.455	79.000	78.143		0.557		1200
*	2.007	SW12	79.000	78.143		0.557	78.800	77.903		0.597		1200
*	1.002	SW13	78.800	77.903		0.597	78.800	77.565		0.935	Hydro-Brake®	1200
*	1.003	PW03	78.800	77.565		0.785	78.100	76.600		1.050		1200

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	I	Min Level (m)	D,L (mm)	W (mm)
1.003	Ex MH	78 100	76 600		0.000	450	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Iotal Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0 000
Manhole Headloss Coeff (Global)	0.500	Run Iime (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	13
Number of Online Controls	1	Number of Iime/Area Diagrams	0
Number of Offline Controls	0	Number of Real Iime Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	1
Site Iocation GB 373850 440650 SD 73850 40650	
C (1km)	-0.025
D1 (1km)	0.398
D2 (1km)	0.385
D3 (1km)	0 430
E (1km)	0 299
F (1km)	2 444
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

Online Controls for Storm

Hydro-Brake® Manhole: SW13, DS/PN: 1.002, Volume (m³): 4.4

Design Head (m) 0.800 Hydro-Brake® Type Md4 Invert Level (m) 77.903
Design Flow (l/s) 8.9 Diameter (mm) 112

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.3	1.200	10.7	3.000	16.9	7.000	25.9
0.200	8.0	1.400	11.6	3.500	18.3	7.500	26.8
0.300	7.8	1.600	12.4	4.000	19.6	8.000	27.6
0.400	6.9	1.800	13.1	4.500	20.7	8.500	28.5
0.500	7.1	2.000	13.8	5.000	21.9	9.000	29.3
0.600	7.6	2.200	14.5	5.500	22.9	9.500	30.1
0.800	8.7	2.400	15.1	6.000	23.9		
1.000	9.8	2.600	15.8	6.500	24.9		

Storage Structures for Storm

Porous Car Park Manhole: SW01, DS/PN: 1.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	4.2
Membrane Percolation (mm/hr)	1	Length (m)	30.0
Max Percolation (l/s)	0.0	Slope (1:X)	153.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.375	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW02, DS/PN: 1.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	30.4
Max Percolation (l/s)	0.0	Slope (1:X)	151.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.180	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW03, DS/PN: 2.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	36.0
Max Percolation (l/s)	0.1	Slope (1:X)	72.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	80.575	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW04, DS/PN: 3.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	4.2
Membrane Percolation (mm/hr)	1	Length (m)	26.0
Max Percolation (l/s)	0.0	Slope (1:X)	152.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	80.500	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW05, DS/PN: 2.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	22.5
Max Percolation (l/s)	0.0	Slope (1:X)	15.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	80.329	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW06, DS/PN: 4.000

Infiltration Coefficient Base (m/hr)	0.00000	Safety Factor	2.0
Membrane Percolation (mm/hr)	1	Porosity	0.30
Max Percolation (l/s)	0.0	Invert Level (m)	78.925

Porous Car Park Manhole: SW06, DS/PN: 4.000

Width (m)	4.2	Depression Storage (mm)	5
Length (m)	28.5	Evaporation (mm/day)	3
Slope (1:X)	569.0	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW07, DS/PN: 2.002

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	22.8
Max Percolation (l/s)	0.0	Slope (1:X)	139.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.875	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW08, DS/PN: 2.003

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	23.0
Max Percolation (l/s)	0.0	Slope (1:X)	139.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.711	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW09, DS/PN: 2.004

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	17.1
Max Percolation (l/s)	0.0	Slope (1:X)	139.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.545	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW10, DS/PN: 2.005

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	14.1
Max Percolation (l/s)	0.0	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.347	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW11, DS/PN: 2.006

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	14.1
Max Percolation (l/s)	0.0	Slope (1:X)	139.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.245	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW12, DS/PN: 2.007

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	33.0
Max Percolation (l/s)	0.1	Slope (1:X)	139.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.143	Cap Volume Depth (m)	0.000

Cellular Storage Manhole: SW13, DS/PN: 1.002

Invert Level (m)	77.903	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	700.0	450.0	1.300	0.0	530.6
0.100	700.0	458.5	1.400	0.0	530.6
0.200	700.0	467.0	1.500	0.0	530.6
0.300	700.0	475.5	1.600	0.0	530.6
0.400	700.0	483.9	1.700	0.0	530.6
0.500	700.0	492.4	1.800	0.0	530.6
0.600	700.0	500.9	1.900	0.0	530.6
0.700	700.0	509.4	2.000	0.0	530.6
0.800	700.0	517.9	2.100	0.0	530.6
0.900	700.0	526.4	2.200	0.0	530.6
1.000	700.0	530.6	2.300	0.0	530.6
1.100	0.0	530.6	2.400	0.0	530.6
1.200	0.0	530.6	2.500	0.0	530.6

Summary of Critical Results by Maximum Level (Rank 1) for Storm

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DIS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30
Climate Change (%)	0, 0

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
1.000	15 Winter	30	0%					
1.001	15 Winter	30	0%	30/15 Summer				
2.000	15 Winter	30	0%					
3.000	15 Winter	30	0%					
2.001	15 Winter	30	0%					
4.000	15 Winter	30	0%					
2.002	15 Winter	30	0%					
2.003	15 Winter	30	0%	30/15 Summer				
2.004	15 Winter	30	0%	30/15 Summer				
2.005	15 Winter	30	0%					
2.006	15 Winter	30	0%					
2.007	30 Winter	30	0%					
1.002	720 Winter	30	0%	30/60 Winter				
1.003	2880 Summer	30	0%					

PN	US/MH Name	Water Level (m)	Surch'ed Depth (m)	Flooded Volume (m^3)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
1.000	SW01	78.480	-0.120	0.000	0.43	0.0	16.8	OK
1.001	SW02	78.445	0.040	0.000	1.12	0.0	44.1	SURCHARGED
2.000	SW03	80.656	-0.144	0.000	0.28	0.0	15.3	OK
3.000	SW04	80.587	-0.138	0.000	0.31	0.0	12.2	OK
2.001	SW05	80.426	-0.128	0.000	0.37	0.0	45.0	OK
4.000	SW06	79.071	-0.079	0.000	0.41	0.0	8.2	OK
2.002	SW07	79.088	-0.012	0.000	0.93	0.0	37.3	OK
2.003	SW08	78.980	0.044	0.000	0.96	0.0	38.9	SURCHARGED
2.004	SW09	78.830	0.060	0.000	1.25	0.0	49.2	SURCHARGED
2.005	SW10	78.588	-0.059	0.000	0.84	0.0	65.6	OK
2.006	SW11	78.518	-0.027	0.000	1.00	0.0	78.3	OK
2.007	SW12	78.393	-0.050	0.000	1.00	0.0	86.4	OK
1.002	SW13	78.357	0.154	0.000	0.05	0.0	7.9	SURCHARGED
1.003	PW03	77.601	-0.414	0.000	0.02	0.0	7.9	OK

Existing Network Details for Storm

* - Indicates pipe has been modified outside of System 1

	PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
*	1.000	29.833	0.195	153.0	0.050	5.00	0.600	o	225
*	1.001	30.463	0.202	150.8	0.144	0.00	0.600	o	225
*	2.000	17.692	0.246	71.9	0.042	5.00	0.600	o	225
*	3.000	26.019	0.171	152.2	0.036	5.00	0.600	o	225
*	2.001	22.361	1.454	15.4	0.050	0.00	0.600	o	225
*	4.000	28.460	0.050	569.2	0.025	5.00	0.600	o	225
*	2.002	22.825	0.164	139.2	0.029	0.00	0.600	o	225
*	2.003	23.022	0.166	138.7	0.069	0.00	0.600	o	225
*	2.004	17.117	0.123	139.2	0.081	0.00	0.600	o	225
*	2.005	14.142	0.102	138.6	0.088	0.00	0.600	o	300
*	2.006	14.142	0.102	138.6	0.070	0.00	0.600	o	300
*	2.007	33.242	0.240	138.5	0.067	0.00	0.600	o	300
*	1.002	5.000	0.338	14.8	0.139	0.00	0.600	o	300
*	1.003	36.125	0.965	37.4	0.000	0.00	0.600	o	450

	PN	US/MH Name	US/CL (m)	US/IL (m)	US C	US Depth (m)	DS/CL (m)	DS/IL (m)	DS C	DS Depth (m)	Ctrl	US/MH (mm)
*	1.000	SW01	79.800	78.375		1.200	79.500	78.180		1.095		1200
*	1.001	SW02	79.500	78.180		1.095	78.800	77.978		0.597		1200
*	2.000	SW03	82.000	80.575		1.200	81.700	80.329		1.146		1200
*	3.000	SW04	81.700	80.500		0.975	81.700	80.329		1.146		1200
*	2.001	SW05	81.700	80.329		1.146	80.500	78.875		1.400		1200
*	4.000	SW06	80.300	78.925		1.150	80.500	78.875		1.400		1200
*	2.002	SW07	80.500	78.875		1.400	79.800	78.711		0.864		1200
*	2.003	SW08	79.800	78.711		0.864	79.800	78.545		1.030		1200
*	2.004	SW09	79.800	78.545		1.030	79.000	78.422		0.353		1200
*	2.005	SW10	79.000	78.347		0.353	79.000	78.245		0.455		1200
*	2.006	SW11	79.000	78.245		0.455	79.000	78.143		0.557		1200
*	2.007	SW12	79.000	78.143		0.557	78.800	77.903		0.597		1200
*	1.002	SW13	78.800	77.903		0.597	78.800	77.565		0.935	Hydro-Brake®	1200
*	1.003	PW03	78.800	77.565		0.785	78.100	76.600		1.050		1200

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C Level (m)	I Level (m)	I Min Level (m)	D,L (mm)	W (mm)
1.003	Ex MH	78.100	76.600	0.000	450	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Iotal Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	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 Storage Structures	13
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	1
Site Location	GB 373850 440650 SD 73850 40650
C (1km)	-0.025
D1 (1km)	0.398
D2 (1km)	0.385
D3 (1km)	0.430
E (1km)	0.299
F (1km)	2.444
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

Online Controls for Storm

Hydro-Brake® Manhole: SW13, DS/PN: 1.002, Volume (m^3): 4.4

Design Head (m) 0.800 Hydro-Brake® Type Md4 Invert Level (m) 77.903
Design Flow (l/s) 8.9 Diameter (mm) 112

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.3	1.200	10.7	3.000	16.9	7.000	25.9
0.200	8.0	1.400	11.6	3.500	18.3	7.500	26.8
0.300	7.8	1.600	12.4	4.000	19.6	8.000	27.6
0.400	6.9	1.800	13.1	4.500	20.7	8.500	28.5
0.500	7.1	2.000	13.8	5.000	21.9	9.000	29.3
0.600	7.6	2.200	14.5	5.500	22.9	9.500	30.1
0.800	8.7	2.400	15.1	6.000	23.9		
1.000	9.8	2.600	15.8	6.500	24.9		

Storage Structures for Storm

Porous Car Park Manhole: SW01, DS/PN: 1.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	4.2
Membrane Percolation (mm/hr)	1	Length (m)	30.0
Max Percolation (l/s)	0.0	Slope (1:X)	153.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.375	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW02, DS/PN: 1.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	30.4
Max Percolation (l/s)	0.0	Slope (1:X)	151.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.180	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW03, DS/PN: 2.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	36.0
Max Percolation (l/s)	0.1	Slope (1:X)	72.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	80.575	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW04, DS/PN: 3.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	4.2
Membrane Percolation (mm/hr)	1	Length (m)	26.0
Max Percolation (l/s)	0.0	Slope (1:X)	152.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	80.500	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW05, DS/PN: 2.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	22.5
Max Percolation (l/s)	0.0	Slope (1:X)	15.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	80.329	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW06, DS/PN: 4.000

Infiltration Coefficient Base (m/hr)	0.00000	Safety Factor	2.0
Membrane Percolation (mm/hr)	1	Porosity	0.30
Max Percolation (l/s)	0.0	Invert Level (m)	78.925

Porous Car Park Manhole: SW06, DS/PN: 4.000

Width (m)	4.2	Depression Storage (mm)	5
Length (m)	28.5	Evaporation (mm/day)	3
Slope (1:X)	569.0	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW07, DS/PN: 2.002

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	22.8
Max Percolation (l/s)	0.0	Slope (1:X)	139.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.875	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW08, DS/PN: 2.003

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	23.0
Max Percolation (l/s)	0.0	Slope (1:X)	139.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.711	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW09, DS/PN: 2.004

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	17.1
Max Percolation (l/s)	0.0	Slope (1:X)	139.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.545	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW10, DS/PN: 2.005

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	14.1
Max Percolation (l/s)	0.0	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.347	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW11, DS/PN: 2.006

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	14.1
Max Percolation (l/s)	0.0	Slope (1:X)	139.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.245	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW12, DS/PN: 2.007

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	33.0
Max Percolation (l/s)	0.1	Slope (1:X)	139.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.143	Cap Volume Depth (m)	0.000

Cellular Storage Manhole: SW13, DS/PN: 1.002

Invert Level (m)	77.903	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	700.0	450.0	1.300	0.0	530.6
0.100	700.0	458.5	1.400	0.0	530.6
0.200	700.0	467.0	1.500	0.0	530.6
0.300	700.0	475.5	1.600	0.0	530.6
0.400	700.0	483.9	1.700	0.0	530.6
0.500	700.0	492.4	1.800	0.0	530.6
0.600	700.0	500.9	1.900	0.0	530.6
0.700	700.0	509.4	2.000	0.0	530.6
0.800	700.0	517.9	2.100	0.0	530.6
0.900	700.0	526.4	2.200	0.0	530.6
1.000	700.0	530.6	2.300	0.0	530.6
1.100	0.0	530.6	2.400	0.0	530.6
1.200	0.0	530.6	2.500	0.0	530.6

Summary of Critical Results by Maximum Level (Rank 1) for Storm

Margin for Flood Risk Warning (mm)	300 0
Analysis Timestep	2.5 Second Increment (Extended)
DIS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 30

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
1.000	720 Winter	100	+30%	100/15 Summer				
1.001	720 Winter	100	+30%	30/15 Summer				
2.000	15 Winter	100	+30%					
3.000	15 Winter	100	+30%					
2.001	15 Winter	100	+30%					
4.000	15 Winter	100	+30%	100/15 Summer				
2.002	15 Winter	100	+30%	100/15 Summer				
2.003	15 Winter	100	+30%	30/15 Summer				
2.004	15 Winter	100	+30%	30/15 Summer				
2.005	15 Winter	100	+30%	100/15 Summer				
2.006	15 Winter	100	+30%	100/15 Summer				
2.007	720 Winter	100	+30%	100/15 Summer				
1.002	720 Winter	100	+30%	30/60 Winter				
1.003	720 Winter	100	+30%					

PN	US/MH Name	Water Level (m)	Surch'ed Depth (m)	Flooded Volume (m^3)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
1.000	SW01	78.716	0.116	0.000	0.07	0.0	2.9	SURCHARGED
1.001	SW02	78.715	0.310	0.000	0.23	0.0	9.1	SURCHARGED
2.000	SW03	80.694	-0.106	0.000	0.54	0.0	29.7	OK
3.000	SW04	80.628	-0.097	0.000	0.61	0.0	23.6	OK
2.001	SW05	80.474	-0.080	0.000	0.72	0.0	87.5	OK
4.000	SW06	79.367	0.217	0.000	0.65	0.0	12.9	SURCHARGED
2.002	SW07	79.384	0.284	0.000	0.97	0.0	38.9	SURCHARGED
2.003	SW08	79.276	0.340	0.000	1.04	0.0	42.0	SURCHARGED
2.004	SW09	79.108	0.338	0.000	1.45	0.0	56.9	SURCHARGED
2.005	SW10	78.860	0.213	0.000	1.07	0.0	83.7	FLOOD RISK
2.006	SW11	78.750	0.205	0.000	1.34	0.0	105.2	FLOOD RISK
2.007	SW12	78.717	0.274	0.000	0.31	0.0	26.8	FLOOD RISK
1.002	SW13	78.710	0.507	0.000	0.06	0.0	8.8	FLOOD RISK
1.003	PW03	77.605	-0.410	0.000	0.02	0.0	8.8	OK

Appendix H
Calculations – Proposed Foul Sewers

October 2012
Doc Reg No 29421

DESIGN/CALCULATION SHEET

Project No:	29421	**Project Title:**	4 Acre Site, Clitheroe	**Sheet:**	1 of 1
Customer Organisation:	Trustees of Standed Estates			**Date:**	20/09/12
Subject:	FOUL WATER CALCULATIONS			**Made by:**	AW

For Computer Calculations: Operation Performed:

Checker's Initials

and date:

Software Used: Version:Filename (Spreadsheet):

Data Source (Reference & Filename/Path):

Ref:

Foul Water Drainage Calculations have been based on the methodology of "Sewers For Adoption - 6th Edition"

Proposed No. of dwellings = 49

Foul flow per dwelling = 4000 l/h//d (Clause 2.12)

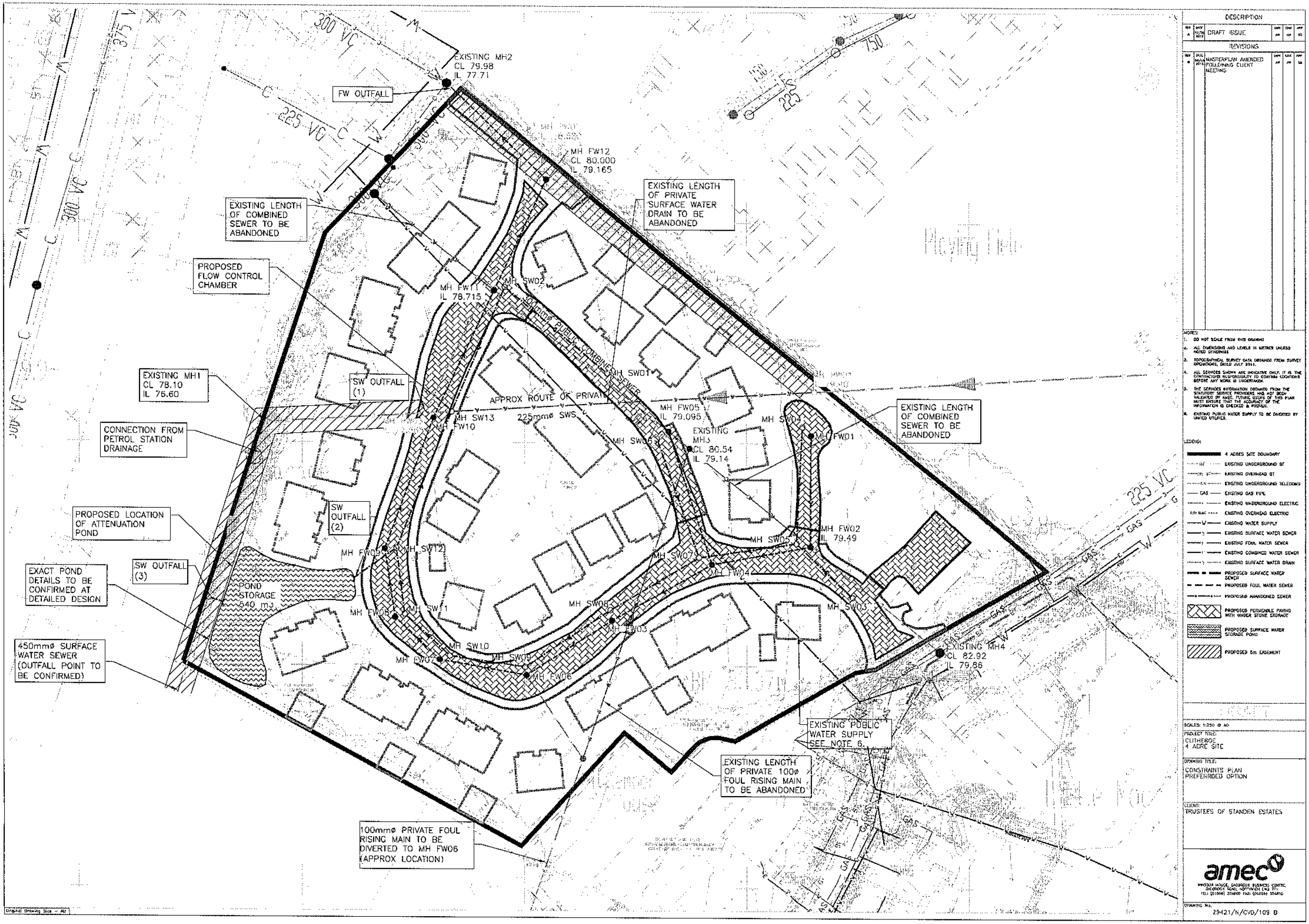
TOTAL FOUL FLOW = 49 x 4000

= 196,000 Litres / Day

= 2.27 **Litres / Sec**

Capacity of 300mm diameter sewer @ 1 in 116 = 91 Litres / Sec (Ks = 1.5)

Appendix I
Drawing No. 29421_N_CVD_109B


EXISTING MH2
CL 79.98
IL 77.71
FW OUTFALL
MH FW12
CL 80.000
IL 79.165
EXISTING LENGTH OF PRIVATE SURFACE WATER DRAIN TO BE ABANDONED
EXISTING LENGTH OF COMBINED SEWER TO BE ABANDONED
PROPOSED FLOW CONTROL CHAMBER
MH FW11
IL 78.715
MH SW02
EXISTING MH1
CL 78.10
IL 76.60
SW OUTFALL (1)
APPROX ROUTE OF PRIVATE 225mmø SWS
MH SW13
MH FW10
MH SW01
MH FW05
IL 79.095
EXISTING MH3
CL 80.54
IL 79.14
MH SW06
MH SW04
MH FW01
EXISTING LENGTH OF COMBINED SEWER TO BE ABANDONED
CONNECTION FROM PETROL STATION DRAINAGE
PROPOSED LOCATION OF ATTENUATION POND
SW OUTFALL (2)
SW OUTFALL (3)
EXACT POND DETAILS TO BE CONFIRMED AT DETAILED DESIGN
POND STORAGE 540 m3
MH FW09
MH SW12
MH FW08
MH SW11
MH SW10
MH SW09
MH FW07
MH FW06
MH SW08
MH FW03
MH SW07
MH FW04
MH SW05
MH FW02
IL 79.49
MH SW03
EXISTING MH4
CL 82.92
IL 79.86
450mmø SURFACE WATER SEWER (OUTFALL POINT TO BE CONFIRMED)
100mmø PRIVATE FOUL RISING MAIN TO BE DIVERTED TO MH FW06 (APPROX LOCATION)
EXISTING LENGTH OF PRIVATE 100ø FOUL RISING MAIN TO BE ABANDONED
EXISTING PUBLIC WATER SUPPLY SEE NOTE 6.
Playing Field
300 VC
225 VC
375 V
750
225
GAS
DESCRIPTION
DRAFT ISSUE
REVISIONS
MASTERPLAN AMENDED FOLLOWING CLIENT MEETING
NOTES:
1. DO NOT SCALE FROM THIS DRAWING
2. ALL DIMENSIONS AND LEVELS IN METRES UNLESS NOTED OTHERWISE
3. TOPOGRAPHICAL SURVEY DATA OBTAINED FROM SURVEY OPERATIONS, DATED JULY 2011.
4. ALL SERVICES SHOWN ARE INDICATIVE ONLY. IT IS THE CONTRACTORS RESPONSIBILITY TO CONFIRM LOCATIONS BEFORE ANY WORK IS UNDERTAKEN.
5. THE SERVICES INFORMATION OBTAINED FROM THE STATUTORY SERVICE PROVIDERS HAS NOT BEEN VALIDATED BY AMEC. FUTURE USERS OF THIS PLAN MUST ENSURE THAT THE ACCURACY OF THE INFORMATION IS CHECKED & PROVEN.
6. EXISTING PUBLIC WATER SUPPLY TO BE DIVERTED BY UNITED UTILITIES.
LEGEND:
4 ACRES SITE BOUNDARY
EXISTING UNDERGROUND BT
EXISTING OVERHEAD BT
EXISTING UNDERGROUND TELECOMS
EXISTING GAS PIPE
EXISTING UNDERGROUND ELECTRIC
EXISTING OVERHEAD ELECTRIC
EXISTING WATER SUPPLY
EXISTING SURFACE WATER SEWER
EXISTING FOUL WATER SEWER
EXISTING COMBINED WATER SEWER
EXISTING SURFACE WATER DRAIN
PROPOSED SURFACE WATER SEWER
PROPOSED FOUL WATER SEWER
PROPOSED ABANDONED SEWER
PROPOSED PERMEABLE PAVING WITH UNDER STONE STORAGE
PROPOSED SURFACE WATER STORAGE POND
PROPOSED 6m EASEMENT
SCALES: 1:250 @ A0
PROJECT TITLE:
CLITHEROE
4 ACRE SITE
DRAWING TITLE:
CONSTRAINTS PLAN
PREFERRED OPTION
CLIENT:
TRUSTEES OF STANDEN ESTATES
amec
DRAWING No.
29421/N/CVD/109 D
Original Drawing Size - A0

Appendix J
Manhole Record Cards

October 2012
Doc Reg No. 29421

amec

Manhole Survey Form

Select from List

Manhole Number	MH 04

Contractor	

Date of Survey	Surveyed by	QA Check		Job No.	Survey Index	Sheet No
13.09.2012	W. ZYMLA	W. ZYMLA				

Location	Road Name	Place Name
	Land in Littlemoor Road, Clitheroe	

Drain Unit	Drainage Area	Co-ordinates (6 figures)	Easting	Northing

Year Laid	Status	Function	Node Type

TBM Used:	TBM Level:

	Shape	Hinged	Lockable	Duty		dia/length	(mm)	width
COVER	R			M		680	X	530

	Step Irons/Ladders	Depth (mm)	Construction	Red Slab/ Taper		length	(mm)	width
SHAFT		200				600	x	500

	Construction	No. Landings		length	(mm)	width
CHAMBER				1050	x	950

Depth Flow (mm)	Depth Silt (mm)	Height Surchg (mm)		Chamber floor depth from cover (mm)	Cover Level (m AOD)
50				1520	78.100

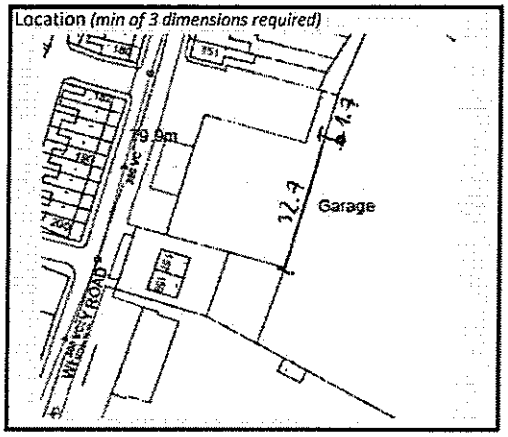
Incoming	upstream MH Ref.	Pipe shape	width/dia (mm)		height/dia (mm)	Backdrop dia	Pipe mat.	Lin. Mat.	Depth from cover (m)	Invert Level (mAOD)	O/C
A		C	225	x	225		VC		1.500	76.600	
B		C	100	x	100		VC		1.490	76.610	
C		C	100	x	100		VC		0.850	77.250	
D		C	225	x	225		VC		1.520	76.580	
E		C	150	x	150		VC		1.100	77.000	
F		C	100	x	100		VC		1.400	76.700	

Outgoing	downstream MH Ref.	Pipe shape	width/dia		height/dia	Backdrop dia	Pipe mat.	Lin. Mat.	Depth from cover (m)	Invert Level (mAOD)	O/C
X		C	450	x	450				1.520	76.580	
Y				x							
Z				x							

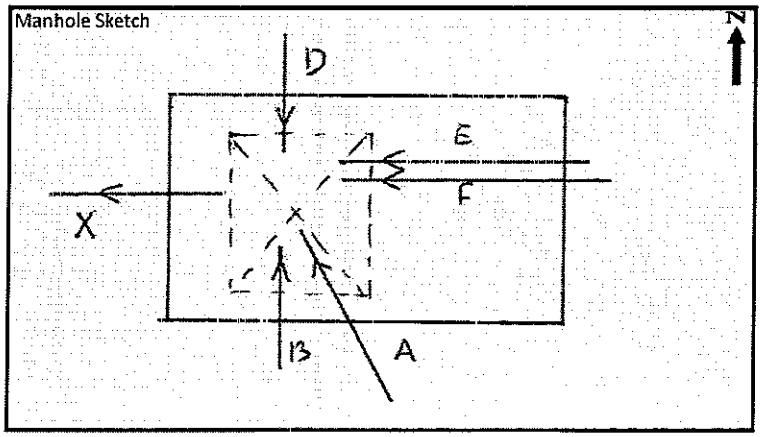
Condition (Y if attention req)	Cover	Irons/Ladders	Shaft	Chamber	Benching	Other

Remarks	

Location *(min of 3 dimensions required)*



Manhole Sketch



amec

Manhole Survey Form

Select from List

Manhole Number	MH 03

Contractor	

Date of Survey	Surveyed by	QA Check		Job No.	Survey Index	Sheet No.
13.09.2012	W. ZYMLA	W. ZYMLA				

Location	Road Name	Place Name
	Land in Littlemoor Road, Clitheroe	

Drain Unit	Drainage Area	Co-ordinates (6 figures)	Easting	Northing

Year Laid	Status	Function	Node Type	TBM Used:	TBM Level:

	Shape	Hinged	Lockable	Duty		dia/length	(mm)	width
COVER	R			M		530	X	530

	Step Irons/Ladders	Depth (mm)	Construction	Red Slab/ Taper		length	(mm)	width
SHAFT		70				460	x	460

	Construction	No. Landings		length	(mm)	width
CHAMBER				860	x	460

Depth Flow (mm)	Depth Silt (mm)	Height Surchg (mm)		Chamber floor depth from cover (mm)	Cover Level (m AOD)
30				890	79.340

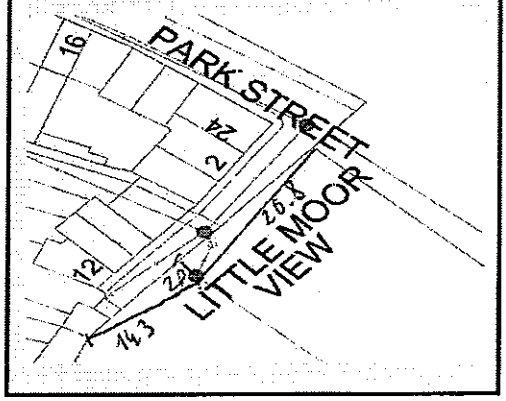
Incoming	upstream MH Ref.	Pipe shape	width/dia (mm)		height/dia (mm)	Backdrop dia	Pipe mat.	Lin. Mat.	Depth from cover (m)	Invert Level (mAOD)	O/C
A		C	300	x	300		VC		0.890	78.450	
B				x							
C				x							
D				x							
E				x							
F				x							

Outgoing	downstream MH Ref.	Pipe shape	width/dia		height/dia	Backdrop dia	Pipe mat.	Lin. Mat.	Depth from cover (m)	Invert Level (mAOD)	O/C
X		C	300	x	300		VC		0.890	78.450	
Y				x							
Z				x							

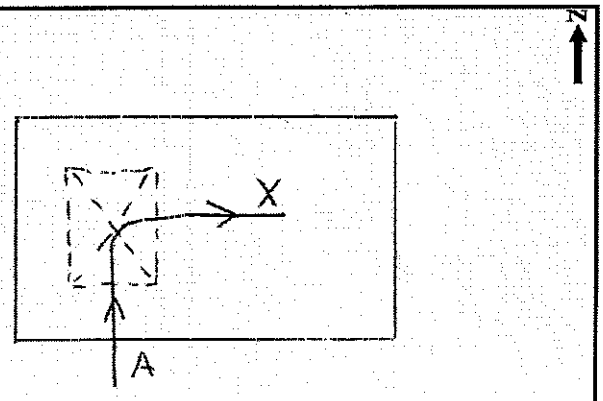
Condition (Y if attention req)	Cover	Irons/Ladders	Shaft	Chamber	Benching	Other

Remarks	

Location *(min of 3 dimensions required)*



Manhole Sketch



amec

Manhole Survey Form

Select from List

Manhole Number	MH 04

Contractor	

Date of Survey	Surveyed by	QA Check		Job No	Survey Index	Sheet No
13.09.2012	W. ZYMLA	W. ZYMLA				

Location	Road Name	Place Name
	Land in Littlemoor Road, Clitheroe	

Drain Unit	Drainage Area	Co-ordinates (6 figures)	Easting	Northing

Year Laid	Status	Function	Node Type	TBM Used:	TBM Level:

	Shape	Hinged	Lockable	Duty		dia/length	(mm)	width
COVER	R			M		680	x	530

	Step Irons/Ladders	Depth (mm)	Construction	Red Slab/ Taper		length	(mm)	width
SHAFT		200				600	x	500

	Construction	No Landings		length	(mm)	width
CHAMBER				1050	x	950

Depth Flow (mm)	Depth Silt (mm)	Height Surchg (mm)		Chamber floor depth from cover (mm)	Cover Level (m AOD)
50				1520	78.100

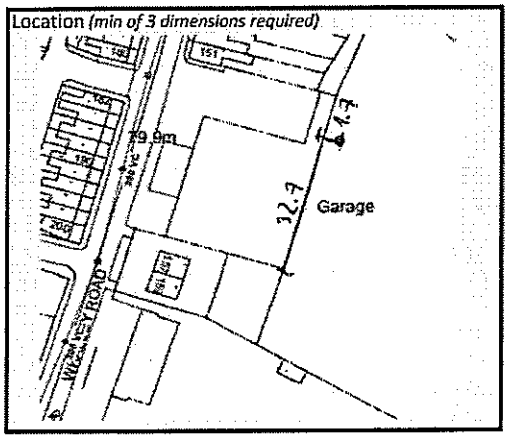
Incoming	upstream MH Ref.	Pipe shape	width/dia (mm)		height/dia (mm)	Backdrop dia	Pipe mat.	Lin. Mat.	Depth from cover (m)	Invert Level (mAOD)	O/C
A		C	225	x	225		VC		1.500	76.600	
B		C	100	x	100		VC		1.490	76.610	
C		C	100	x	100		VC		0.850	77 250	
D		C	225	x	225		VC		1.520	76.580	
E		C	150	x	150		VC		1.100	77.000	
F		C	100	x	100		VC		1.400	76.700	

Outgoing	downstream MH Ref.	Pipe shape	width/dia		height/dia	Backdrop dia	Pipe mat.	Lin. Mat.	Depth from cover (m)	Invert Level (mAOD)	O/C
X		C	450	x	450				1.520	76.580	
Y				x							
Z				x							

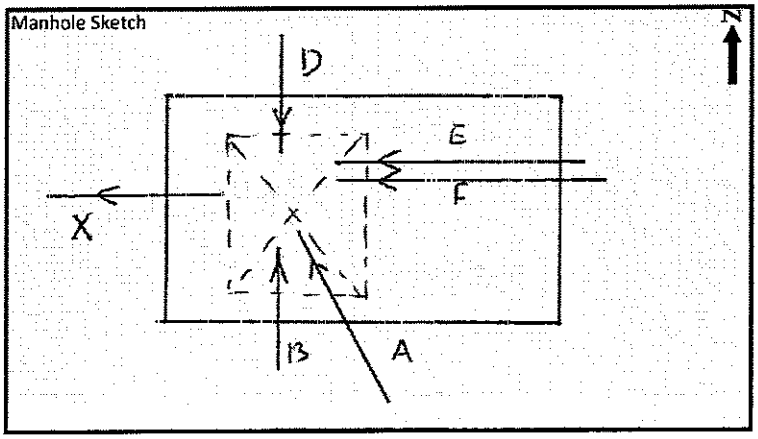
Condition (Y if attention req)	Cover	Irons/Ladders	Shaft	Chamber	Benching	Other

Remarks	

Location *(min of 3 dimensions required)*



Manhole Sketch



amec

Manhole Survey Form

Select from List

Manhole Number	MH 01

Contractor	

Date of Survey	Surveyed by	QA Check		Job No	Survey Index	Sheet No
13.09.2012	W. ZYMLA	W. ZYMLA				

Location	Road Name	Place Name
	Land in Littlemoor Road, Clitheroe	

Drain Unit	Drainage Area	Co-ordinates (6 figures)	Easting	Northing

Year Laid	Status	Function	Node Type	TBM Used:	TBM Level:

	Shape	Hinged	Lockable	Duty		dia/length	(mm)	width
COVER	S			H			X	

	Step Irons/Ladders	Depth (mm)	Construction	Red Slab/ Taper		length	(mm)	width
SHAFT							x	

	Construction	No. Landings		length	(mm)	width
CHAMBER					x	

Depth Flow (mm)	Depth Silt (mm)	Height Surchg (mm)		Chamber floor depth from cover (mm)	Cover Level (m AOD)
				3.06	82.920

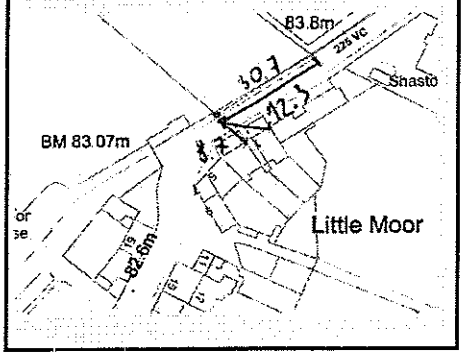
Incoming	upstream MH Ref.	Pipe shape	width/dia (mm)		height/dia (mm)	Backdrop dia	Pipe mat.	Lin. Mat.	Depth from cover (m)	Invert Level (mAOD)	O/C
A		C	300	x	300	300			2.850	80.070	
B		C	225	x	225				2.100	80.820	
C		C	225	x	225				2.800	80.120	
D		C	300	x	300				3.060	79.860	
E		C		x							
F		C		x							

Outgoing	downstream MH Ref.	Pipe shape	width/dia		height/dia	Backdrop dia	Pipe mat.	Lin. Mat.	Depth from cover (m)	Invert Level (mAOD)	O/C
X		C	300	x	300				3.060	79.860	
Y				x							
Z				x							

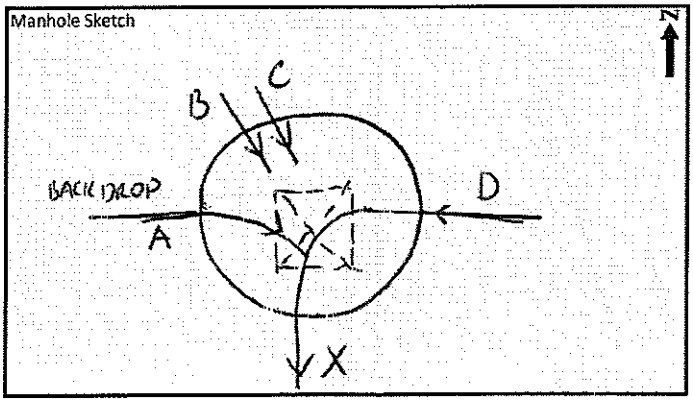
Condition (Y if attention req)	Cover	Irons/Ladders	Shaft	Chamber	Benching	Other

Remarks	

Location *(min of 3 dimensions required)*



Manhole Sketch



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Manhole Survey Form

Select from List

Manhole Number	MH 02

Contractor	

Date of Survey	Surveyed by	QA Check		Job No.	Survey Index	Sheet No.
13.09.2012	W. ZYMLA	W. ZYMLA				

Location	Road Name	Place Name
	Land in Littlemoor Road, Clitheroe	

Drain Unit	Drainage Area	Co-ordinates (6 figures)	Easting	Northing

Year Laid	Status	Function	Node Type

TBM Used:	TBM Level:

	Shape	Hinged	Lockable	Duty		dia/length	(mm)	width
COVER	R			H		620	X	620

	Step Irons/Ladders	Depth (mm)	Construction	Red Slab/ Taper		length	(mm)	width
SHAFT		200				610	x	610

	Construction	No. Landings		length	(mm)	width
CHAMBER				1270	x	800

Depth Flow (mm)	Depth Silt (mm)	Height Surchg (mm)		Chamber floor depth from cover (mm)	Cover Level (m AOD)
20				1390	80.540

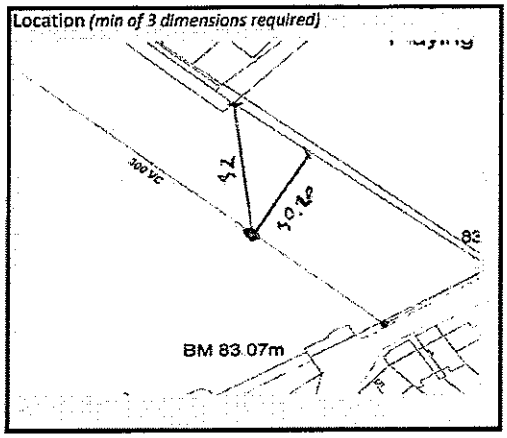
Incoming	upstream MH Ref.	Pipe shape	width/dia (mm)		height/dia (mm)	Backdrop dia	Pipe mat.	Lin. Mat.	Depth from cover (m)	Invert Level (mAOD)	O/C
A		C	300	x	300		VC		1.390	79.150	
B		C	100	x	100		VC		1.220	79.320	
C				x							
D				x							
E				x							
F				x							

Outgoing	downstream MH Ref.	Pipe shape	width/dia		height/dia	Backdrop dia	Pipe mat.	Lin. Mat.	Depth from cover (m)	Invert Level (mAOD)	O/C
X		C	300	x	300		VC		1.400	79.140	
Y				x							
Z				x							

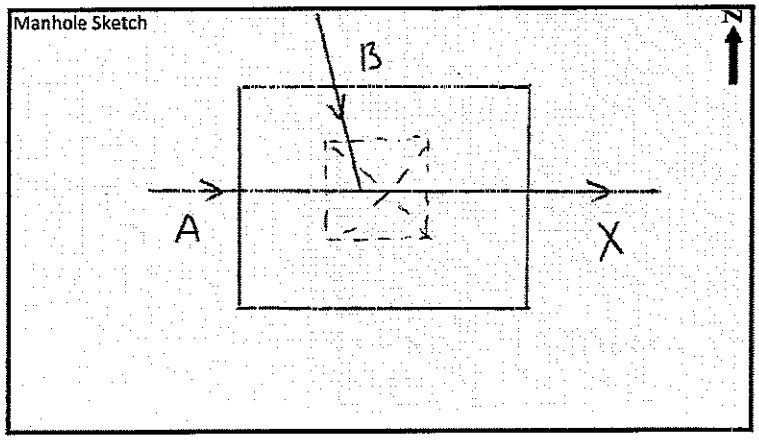
Condition (Y if attention req)	Cover	Irons/Ladders	Shaft	Chamber	Benching	Other

Remarks	

Location *(min of 3 dimensions required)*



Manhole Sketch



amec

Manhole Survey Form

Select from List

Manhole Number	MH 02

Contractor	

Date of Survey	Surveyed by	QA Check		Job No	Survey Index	Sheet No
13.09.2012	W. ZYMLA	W. ZYMLA				

Location	Road Name	Place Name
	Land in Littlemoor Road, Clitheroe	

Drain Unit	Drainage Area	Co-ordinates (6 figures)	Easting	Northing

Year Laid	Status	Function	Node Type	TBM Used:	TBM Level:

COVER	Shape	Hinged	Lockable	Duty		dia/length	(mm)	width
	R			H		620	X	620

SHAFT	Step Irons/Ladders	Depth (mm)	Construction	Red Slab/ Taper		length	(mm)	width
		200				610	x	610

CHAMBER	Construction	No. Landings		length	(mm)	width
				1270	x	800

Depth Flow (mm)	Depth Silt (mm)	Height Surchg (mm)		Chamber floor depth from cover (mm)	Cover Level (m AOD)
20				1390	80.540

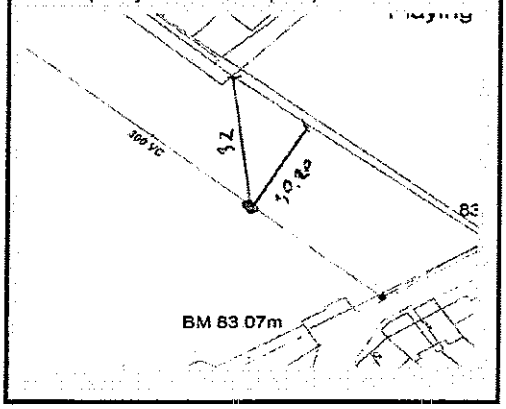
Incoming	upstream MH Ref.	Pipe shape	width/dia (mm)		height/dia (mm)	Backdrop dia	Pipe mat.	Lin. Mat.	Depth from cover (m)	invert Level (mAOD)	O/C
A		C	300	x	300		VC		1.390	79.150	
B		C	100	x	100		VC		1.220	79.320	
C				x							
D				x							
E				x							
F				x							

Outgoing	downstream MH Ref.	Pipe shape	width/dia		height/dia	Backdrop dia	Pipe mat.	Lin. Mat.	Depth from cover (m)	invert Level (mAOD)	O/C
X		C	300	x	300		VC		1.400	79.140	
Y				x							
Z				x							

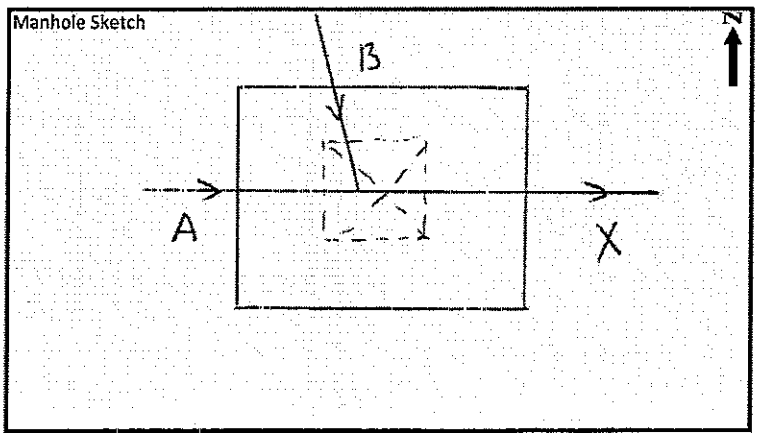
Condition (Y if attention req)	Cover	Irons/Ladders	Shaft	Chamber	Benching	Other

Remarks	

Location *(min of 3 dimensions required)*



Manhole Sketch



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Manhole Survey Form Notes

Additional Notes or Sketches

Abbreviations Key

Status	
PU	Public
PR	Private
HD	Highway Drain
WC	Watercourse
A	Abandoned
TC	To Be Constructed
104	Section 104
102	Section 102
DM	Disposal Main
OV	Overflow Pipe
EO	Emergency Overflow

Function	
F	Foul
S	Surface
C	Combined
T	Transition
O	Overflow
U	Unspecified

Cover Shape	
S	Square
R	Rectangular
T	Triangular
D	Double Triangle
C	Circular
O	Oval
L	Clover Leaf
U	Unspecified

Duty	
L	Light
M	Medium
H	Heavy
U	Unspecified

Node Type	
MH	Manhole
J	Junction (Saddle)
LH	Lamphole
HB	Hatchbox
RE	Rodding Eye
OF	Outfall
CSO	Combined Storm Overflow
SPS	Pumping Station
STW	Treatment Works
OI	Oil Interceptor
IN	Inlet
XXX	Undefined Structure
CE	Capped End
BP	Balancing Pond
TE	Termination Node
AV	Air Valve
ZZZ	Unknown End
CN	Continuation Node
ATC	Attribute Change
HC	Flow Control
BT	Balancing Tank
TC	Treatment Chamber
ST	Storage Tank
FC	Flushing Chamber
BS	Blind Shaft
AO	Access Only
CP	Catch Pit
GI	Grease Interceptor

Steps/Irons/Ladders	
S	steps
L	ladder

Red/Slab/Taper	
R	Reduced Slab
T	Taper

Shaft/Chamber Construction	
B	Brick
P	Precast Units
G	Glass Reinforced Plastic
I	In-Situ
S	Segmental
L	Plastic (Other)
R	Rendered
U	Unspecified

Pipe Shape	
A	Arch
B	Barrel
C	Circular
E	Egg
H	Horseshoe
K	Kerb Block
O	Oval
R	Rectangular
S	Square
T	Trapezoidal
U	U-Shaped with Flat Top
Z	Other

Manhole Lining Material	
FIBRE	Fibre Glass
CEMENT	Cementitious
POLY	Polyethylene

Pipe Type	
PMP	Rising Main
GRV	Gravity Main
LAT	Lateral
SYP	Syphon
VAC	Vacuum

Pipe Material	
AC	Asbestos Cement
AK	Alkathene
BL	Bitumen (Lining)
BR	Brick
CC	Concrete Box Culvert
CI	Cast Iron
CL	Cement Mortar (Lining)
CO	Concrete
CSB	Concrete Segments Bolted
CSU	Concrete Segments Unbolted
DI	Ductile Iron
EP	Epoxy
FC	Fibre Cement
FRP	Fibre Reinforced Plastics
GI	Grey Cast Iron
GRC	Glass Reinforced Concrete
GRP	Glass Reinforced Plastic
MAC	Masonry, Coursed
MAR	Masonry, Random
PE	Polyethylene
PF	Pitch Fibre
PP	Polypropylene
PS	Polyester
PSC	Plastic/Steel Composite
PVC	Polyvinyl Chloride
RC	Reinforced Concrete
RPM	Reinforced Plastic Matrix
SI	Spun Iron
SPC	Sprayed Concrete
ST	Steel
U	Unspecified
VC	Vitrified Clay
X	Unidentified Material
XI	Unidentified Type of Iron/Steel
XP	Unidentified type of Plastics
Z	Other

- All yellow fields to be completed
- It is essential that the upstream and downstream manhole reference is filled in along with the O/C The O/C value is the directior of the pipe in relation to North (ie North = 12, East = 3, etc

amec

Manhole Survey Form

Select from List

Manhole Number	MH 01

Contractor	

Date of Survey	Surveyed by	QA Check		Job No	Survey Index	Sheet No
13.09.2012	W. ZYMLA	W. ZYMLA				

Location	Road Name	Place Name
	Land in Littlemoor Road, Clitheroe	

Drain Unit	Drainage Area	Co-ordinates (6 figures)	Easting	Northing

Year Laid	Status	Function	Node Type	TBM Used:	TBM Level:

	Shape	Hinged	Lockable	Duty		dia/length	(mm)	width
COVER	S			H			X	

	Step Irons/Ladders	Depth (mm)	Construction	Red Slab/ Taper		length	(mm)	width
SHAFT							x	

	Construction	No Landings		length	(mm)	width
CHAMBER					x	

Depth Flow (mm)	Depth Silt (mm)	Height Surchg (mm)		Chamber floor depth from cover (mm)	Cover Level (m AOD)
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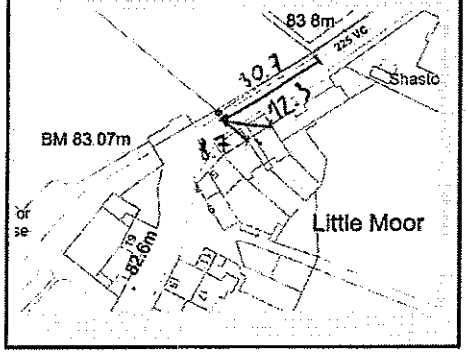
C		C	225	x	225				2.800	80.120	
D		C	300	x	300				3.060	79.860	
E		C		x							
F		C		x							

Outgoing	downstream MH Ref.	Pipe shape	width/dia		height/dia	Backdrop dia	Pipe mat.	Lin. Mat.	Depth from cover (m)	Invert Level (mAOD)	O/C
X		C	300	x	300				3.060	79.860	
Y				x							
Z				x							

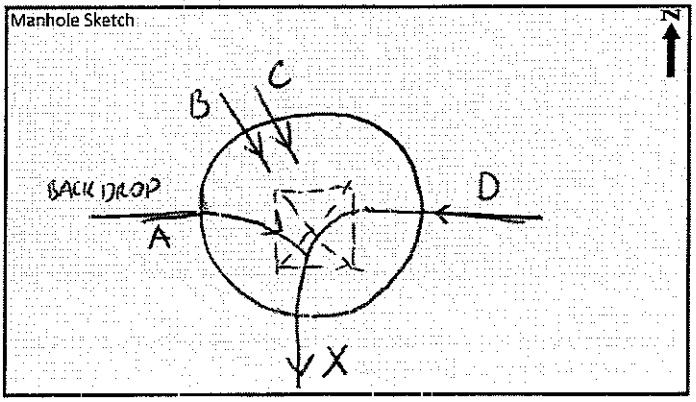
Condition (Y if attention req)	Cover	Irons/Ladders	Shaft	Chamber	Benching	Other

Remarks	

Location *(min of 3 dimensions required)*



Manhole Sketch



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T	Trapezoidal
U	U-Shaped with Flat Top
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AK	Alkathene
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CI	Cast Iron
CL	Cement Mortar (Lining)
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CSB	Concrete Segments Bolted
CSU	Concrete Segments Unbolted
DI	Ductile Iron
EP	Epoxy
FC	Fibre Cement
FRP	Fibre Reinforced Plastics
GI	Grey Cast Iron
GRC	Glass Reinforced Concrete
GRP	Glass Reinforced Plastic
MAC	Masonry, Coursed
MAR	Masonry, Random
PE	Polyethylene
PF	Pitch Fibre
PP	Polypropylene
PS	Polyester
PSC	Plastic/Steel Composite
PVC	Polyvinyl Chloride
RC	Reinforced Concrete
RPM	Reinforced Plastic Matrix
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Sarah Westwood

From: Richard Percy [richardp@abbott-associates co.uk]
Sent: 08 October 2012 09:46
To: Sarah Westwood
Subject: FW: 4 Acres Residential Site, Clitheroe - Outline Drainage Strategy Report
Attachments: Copy of UU's Letter Dated 10 08.2012.pdf; Appendix C_Email from Graham Perry (UU) to AMEC dated 6 09.2012.pdf; 29421_N_CVD_107_A pdf; Appendix E - Consulation.pdf; Marked Up Site Plan_CCTV Survey.jpg; Marked Up Site Plan_CCTV Survey pdf; 4 Acre Site 30yr.pdf; 4 Acre Site 100yr.pdf; Foul Calcs.pdf; 29421_N_CVD_109 REV B pdf; 29421_N_CVD_109 REV B.pdf

Sarah
This is the one which bounced back, I think. Please confirm receipt of the full (3 part) set.
Regards.

Richard

From: Richard Percy
Sent: Friday October 05 2012 15:36
To: 'Sarah Westwood'
Subject: FW: 4 Acres Residential Site, Clitheroe - Outline Drainage Strategy Report

Sarah
Appendices to drainage report
This is the last email Please confirm receipt of all 3
Regards.

Richard

From: sammy.spaine@amec.com [mailto:sammy.spaine@amec.com]
Sent: Wednesday October 03 2012 17:11
To: Richard Percy
Cc: chris.prydderch@amec.com; Guy Pearson; john.hall3@amec.com; tracey.wood2@amec.com
Subject: Re: 4 Acres Residential Site, Clitheroe - Outline Drainage Strategy Report

Richard,

Please find attached a complete set of the Appendices to the Outline Drainage Strategy Report as promised.

Regards
Sammy Spaine

From: Sammy Spaine/NOR/ENTEC/NWG
To: Richard Percy <richardp@abbott-associates.co.uk>
Cc: "chris.prydderch@amec.com" <chris.prydderch@amec.com>, Guy Pearson <guy.pearson@tayloryoung.co.uk>, "john.hall3@amec.com" <john.hall3@amec.com>, "kath.smithers@amec.com" <kath.smithers@amec.com> "tracey.wood2@amec.com" <tracey.wood2@amec.com>
Date: 03/10/2012 17:03
Subject: 4 Acres Residential Site Clitheroe - Outline Drainage Strategy Report

---

Richard,

Please find attached the final version of our Outline Drainage Strategy Report as promised. The Appendices will be forwarded to you under a separate email cover.
I will await your formal instruction before forwarding the report to United Utilities

[attachment "Outline Drainage Strategy_Final Report 12390i1 pdf" deleted by Sammy Spaine/NOR/ENTEC/NWG]

Regards
Sammy Spaine

From: Richard Percy <richardp@abbott-associates.co.uk>
To: sammy spaine@amec com'" <sammy.spaine@amec.com>
Cc: "chris.prydderch@amec.com" <chris.prydderch@amec.com>, Guy Pearson <guy.pearson@tayloryoung.co.uk>
'john.hall3@amec.com" <john.hall3@amec.com>, "kath.smithers@amec.com" <kath.smithers@amec.com>
'tracey.wood2@amec.com" <tracey.wood2@amec.com>
Date: 03/10/2012 13:48
Subject: RE: 5613 - 4 Acres Residential Site Clitheroe Issue 5

Thanks Sammy.
Regards.

Richard

From: sammy.spaine@amec.com [mailto:sammy.spaine@amec.com]
Sent: Wednesday October 03 2012 11:57
To: Richard Percy
Cc: chris.prydderch@amec.com; Guy Pearson; john.hall3@amec.com; kath.smithers@amec.com; tracey.wood2@amec.com
Subject: RE: 5613 - 4 Acres Residential Site, Clitheroe Issue 5

Richard,

I received the copy of your revised Masterplan from Guy Pearson yesterday afternoon. The Final version of our Outline Drainage Strategy Report has been completed, incorporating the revised Masterplan This is now being formatted by Professional Support Team and will be issued to you today

Regards
Sammy Spaine

From: Richard Percy <richardp@abbott-associates.co.uk>
To: "'sammy spaine@amec com'" <sammy.spaine@amec.com> Guy Pearson <guy.pearson@tayloryoung.co.uk>
Cc: "john.hall3@amec.com' <john.hall3@amec.com> "chris.prydderch@amec.com" <chris.prydderch@amec.com>
Date: 02/10/2012 13:54
Subject: RE: 5613 - 4 Acres Residential Site Clitheroe Issue 5

Sammy
Can you give me an ETA for the revised report?
Thanks

Richard

From: sammy.spaine@amec.com[mailto:sammy.spaine@amec.com]
Sent: Tuesday October 02 2012 13:36
To: Guy Pearson
Cc: Richard Percy; john.hall3@amec.com; chris.prydderch@amec.com
Subject: RE: 5613 - 4 Acres Residential Site, Clitheroe Issue 5

Guy,

Thanks for forwarding a copy of your revised Masterplan to me yesterday. Our Constraints Plan (Drawing No. 29421_N_CVD_109B), has been updated accordingly and a copy is attached. I note however that there is still insufficient clearance for the required easement strip for the section of the existing private surface water drain between Manholes' MH S13 and MH 1.

Regards
Sammy Spaine BEng Hons, CEng MICE, AMAE, APMP
Technical Director
AMEC
Environment and Infrastructure UK Ltd
Windsor House, Gadbrook Business Centre, Northwich Cheshire CW9 7TN UK
Tel +44 (0) 01606 354800, Fax +44(0) 01606 354810
Direct +44 (0)01606 354842 mobile/cell 07803 078418
mailto:sammy.spaine@amec.com
amec.com

From: Guy Pearson <guy.pearson@tayloryoung.co.uk>
To: Richard Percy <richardp@abbott-associates.co.uk>, "'sammy.spaine@amec.com'" <sammy.spaine@amec.com>
Date: 02/10/2012 11:55
Subject: RE: 5613 - 4 Acres Residential Site, Clitheroe Issue 5

Richard,

we have shown a garage for 2 - 3 properties on the southern boundary. There is also plenty of room for parking in front of the gable end of the NE most unit

Kind Regards

Guy Pearson
Associate Director

IBI TaylorYoung
Chadsworth House
Wilmslow Road
Handforth
Cheshire
SK9 3HP
DDI +44(0)1625 542 252
Tel +44(0)1625 542 200
Fax +44(0)1625 542 250

guy.pearson@tayloryoung.co.uk
www.tayloryoung.co.uk
IBI TaylorYoung is part of the IBI Group.

From: Richard Percy [mailto:richardp@abbott-associates.co.uk]
Sent: 02 October 2012 08:54
To: Guy Pearson; 'sammy.spaine@amec.com'
Subject: RE: 5613 - 4 Acres Residential Site, Clitheroe Issue 5

Guy
Thanks for that and for turning this round so quickly.
I appreciate that this is only illustrative, but I can't see how the new/repositioned units to the south east of the pond will work, particularly parking-wise. Can you have another quick look at that please.
Sammy – as this is only a drafting issue, can you proceed with your report on the basis of what Guy has currently produced and we can slot any further amended plan later today/this week.
Regards

Richard

From: Guy Pearson (IBI Taylor Young (Handforth)) [mailto:guy.pearson@tayloryoung.co.uk]
Sent: Monday October 01 2012 16:19
To: Richard Percy
Subject: 5613 - 4 Acres Residential Site, Clitheroe Issue 5

5613 - 4 Acres Residential Site, Clitheroe Issue 5

Please click hereto access the documents for this issue

Richard/Sammy,

following our meeting last week would you download and review the revised drawings and let me know if any amendments are required

Richard, will any amendments be required to the D&AS?

Regards,

Guy
Kind Regards

Guy Pearson
Associate Director

IBI TaylorYoung
Chadsworth House
Wilmslow Road
Handforth
Cheshire
SK9 3HP

Tel 01625 542252
Fax +44(0)1625 542 250

Guy.Pearson@tayloryoung.co.uk
www.tayloryoung.co.uk
IBI TaylorYoung is part of the IBI Group

Best Environmental Consultancy 2011, edie Awards for Environmental Excellence
Best for Waste & Resource Management 2011, edie Awards for Environmental Excellence
Best Consultancy 2011, Airport Operators' Association Awards

Best Environmental Consultancy 2011, edie Awards for Environmental Excellence
Best for Waste & Resource Management 2011, edie Awards for Environmental Excellence
Best Consultancy 2011, Airport Operators' Association Awards

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AMEC Nuclear Holdings Limited 03725076, AMEC Nuclear M & O Limited 05664844,
AMEC Nuclear UK Limited 01120437,AMEC Nuclear International Limited 03260477,
AMEC Nuclear Projects Limited 05664962 and National Nuclear Corporation Limited 02290928

7074
SW

United Utilities Water PLC
Developer Services & Planning
Thirlmere House
Lingley Mere Business Park
Lingley Green Avenue
Great Sankey
Warrington WA5 3LP

Telephone 01925 678307
Planning liaison@uuplc.co.uk

Ribble Valley Borough Council
Council Officers, Church Walk
Clitheroe
BB7 2RA

Your ref: 3/2012/0420
Our ref: DC/12/2376
Date: 10-AUG-12

Dear Sir/Madam

Location: Land North and West of Littlemoor Clitheroe Lancashire
Proposal: Outline Application for a Residential Development

With reference to the above planning application,

Recent investigations have confirmed that the sewer network serving the area is nearing capacity. To ensure that there is a consistent & fair approach taken by United Utilities we would ask that all development applications include an indicative layout plan, a schedule showing the type of housing to be built, a program of works showing build rates, a Load & Flow impact assessment, preferred discharge points and proposed rates of flow for each discharge point so that United Utilities can determine the full impact that the development has on our assets Therefore United Utilities will object to the application pending the submission of the additional information

Our water mains will need extending to serve any development on this site The applicant, who may be required to pay a capital contribution, will need to sign an Agreement under Sections 41, 42 & 43 of the Water Industry Act 1991

United Utilities offer a fully supported mapping service at a modest cost for our water mains and sewerage assets. This is a service, which is constantly updated by our Property Searches Team (Tel No: 0870 7510101) It is the applicant's responsibility to demonstrate the exact relationship between any assets that may cross the site and any proposed development

Please note, due to the public sewer transfer, not all sewers are currently shown on the statutory sewer records, if a sewer is discovered during construction, please contact a Building Control Body to discuss the matter further

Yours Faithfully,

Daniel McDermott
Developer Services & Asset Protection
United Utilities

"Perry, Graham" <Graham.Perry@uuplc.co.uk>

06/09/2012 13:10

To: <sammy.spaine@amec.com>,
cc: Richard Percy <richardp@abbott-associates.co.uk>, John Hall <john.hall3@amec.com>, Chris Prydderch <chris.prydderch@amec.com>
Subject: RE: Clitheroe - 4 Acre Site: Proposed Development

Hello Sammy

I would agree that the below is a true reflection of our discussion however the letter from John Lunt was I believe dated 30/08 2011 which is over 12 months ago.

I can also confirm that the Ross officer who will authorize access into the sewer is Emily Astbridge who can be contacted by the following e-mail Emily.Asbridge@uuplc.co.uk

Thanks

Graham Perry

From: sammy.spaine@amec.com [mailto:sammy.spaine@amec.com]
Sent: 06 September 2012 09:58
To: Perry, Graham
Cc: Richard Percy; John Hall; Chris Prydderch
Subject: Clitheroe - 4 Acre Site: Proposed Development

Graham,

I refer to our telephone conversation of yesterday's date regarding the above, and in particular the letter from your Mr. Daniel McDermott dated 10th August 2012. (copy attached).

Please find below my summary of our telephone conversation as agreed:

- An Approval-In-Principle was previously granted by UU via email sent from John Lunt dated 30.08.2012.
- The attached letter superseding the aforementioned email, has been sent out by UU on the basis of the many planning applications for new developments within the catchment which have been submitted over the past twelve months.
- UU are concerned that their current infrastructure may not have sufficient capacity to serve all the proposed development currently up for planning.
- In this regard, UU are now requesting that an Outline Drainage Strategy be submitted consisting of the following information:

1. An estimation of the anticipated foul flows and surface run-offs from the proposed development.
2. Surface Run-offs to be assessed on the basis of the Greenfield Run-off Rate for the catchment.
3. Identification of the proposed discharge outfalls.
4. A Masterplan showing details of the house types being proposed including the Phasing (Programming) of the development.
5. A "Constraints Plan" consisting of current topographical survey data, superimposed over the current Masterplan, merged with the existing sewer information would be suitable at this stage. This plan would also contain the discharge points, together with the values of the anticipated flows. (Foul & Surface Water)

- UU will plug the above information into their current Hydraulic Model for the catchment, to assess

the true impact of this development on their infrastructure.

- The flows and discharge points identified would then be used to define the final Planning Conditions;
- An old copy of the sewer records show a combined Public Sewer, together with a Culverted Watercourse crossing the site. There's a need to undertake a survey of these sections of sewer crossing the site, and to identify any other uncharted sewers within the footprint of the proposed development. AMEC will be required to liaise with the ROSS officer at UU to obtain permission to work within their network. Graham will forward the contact details of their ROSS officer to me via email asap.

I trust the above is a true representation of what was discussed and agreed

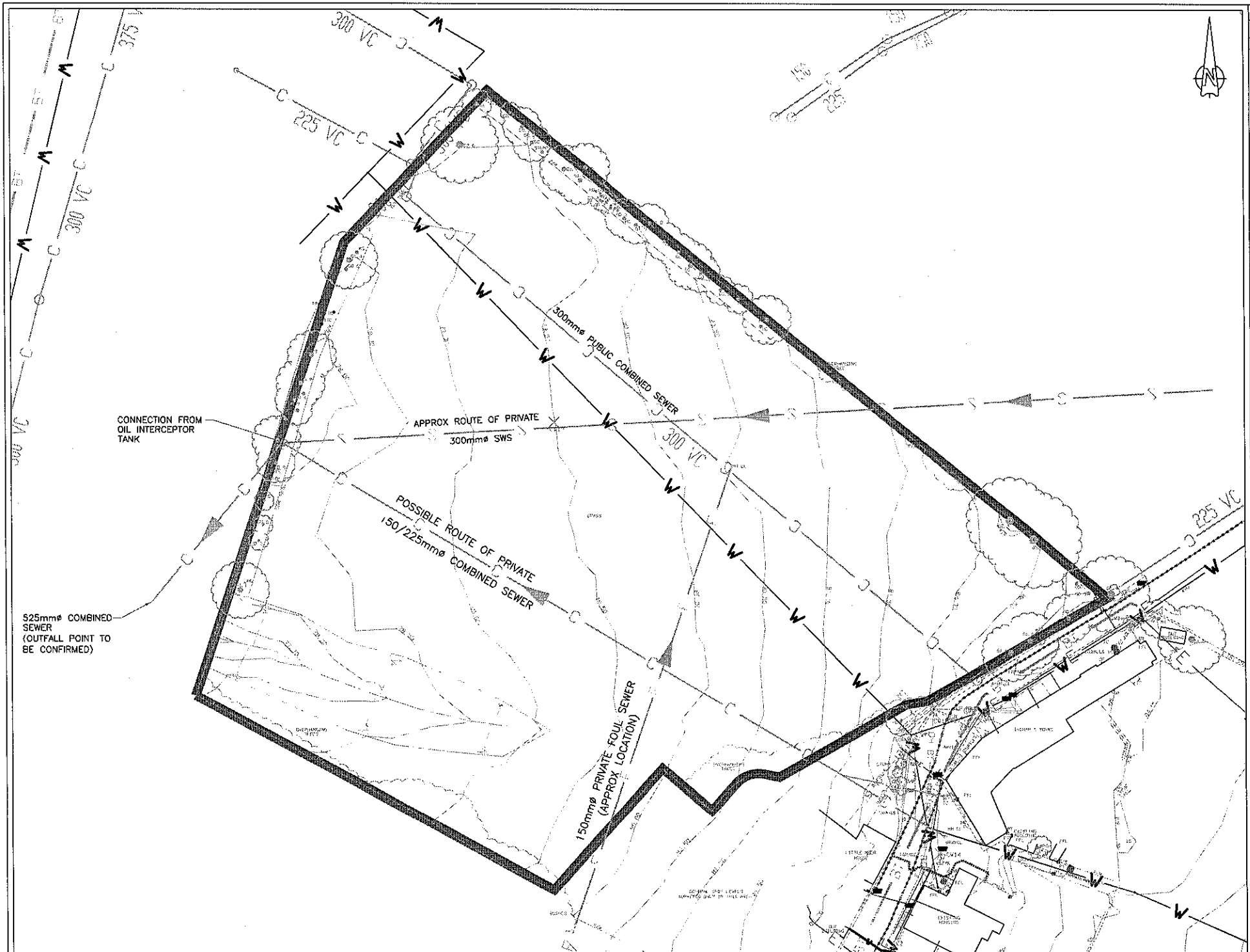
Regards

Sammy Spaine BEng Hons, CEng MICE, AMAE, APMP
Technical Director
AMEC
Environment and Infrastructure UK Ltd
Windsor House, Gadbrook Business Centre, Northwich Cheshire CW9 7TN UK
Tel +44 (0) 01606 354800, Fax +44(0) 01606 354810

Direct +44 (0)01606 354842 mobile/cell 07803 078418

mailto:sammy.spaine@amec.com

amec.com



DESCRIPTION

REV	DATE	DRAWN	CHKD	APP'D
A	[illegible] 2011	DRAFT ISSUE	MR	RS

REVISIONS

REV	DATE	DRWN	CHKD	APP'D

NOTES:

1. DO NOT SCALE FROM THIS DRAWING
2. ALL DIMENSIONS AND LEVELS IN METRES UNLESS NOTED OTHERWISE
3. TOPOGRAPHICAL SURVEY DATA OBTAINED FROM SURVEY OPERATIONS, DATED JULY 2011.
4. ALL SERVICES SHOWN ARE INDICATIVE ONLY, IT IS THE CONTRACTORS RESPONSIBILITY TO CONFIRM LOCATIONS BEFORE ANY WORKS IS UNDERTAKEN.
5. THE SERVICES INFORMATION OBTAINED FROM THE STATUTORY SERVICE PROVIDERS HAS NOT BEEN VALIDATED BY AMEC. FUTURE USERS OF THIS PLAN MUST ENSURE THAT THE ACCURACY OF THE INFORMATION IS CHECKED & PROVEN.

LEGEND:

- 4 ACRES SITE BOUNDARY
- EXISTING UNDERGROUND ST
- EXISTING OVERHEAD ST
- EXISTING UNDERGROUND TELECOMS
- EXISTING GAS PIPE
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING WATER SUPPLY
- EXISTING SURFACE WATER SEWER
- EXISTING FOUL WATER SEWER
- EXISTING COMBINED WATER SEWER

DRAFT

SCALES: 1:250 @ A0

PROJECT TITLE:
CLITHEROE
4 ACRE SITE

DRAWING TITLE:
APPROXIMATE LOCATION OF EXISTING SERVICES

CLIENT:
TRUSTEES OF STANDEN ESTATES

amec
WINDSOR HOUSE, CROMWELL BUSINESS CENTRE, BANBRIDGE ROAD, DOWNPATRICK BT30 7TR
TELL (01838) 384000 FAX (01838) 384010

DRAWING No.
29421/N/CVD/107/A

Original Drawing size = A3

Dawson, Emily

From: Worswick, Colin
Sent: 03 April 2012 10:33
To: NW North Preston, Information Requests
Subject: PRE3187_DFR 31936 - Land at Higher Standon, Clitheroe - FRA

Colin Worswick

Development and Flood Risk Engineer
North Area, North West Region
01772 714259
07741 019565

From: Worswick, Colin
Sent: 22 March 2012 10:02
To: 'stewart.griffiths@amec.com'
Subject: RE: 31936 - Land at Higher Standon, Clitheroe - FRA

Stewart,

I can confirm that both sites lie within Flood Zone 1. We are not aware of any flooding incidents, however you are advised to contact Ribble Valley Borough Council who may have more detailed local records. Surface water run-off must be restricted to existing greenfield rates which is 10l/s/hectare. You will require Flood Defence Consent to culvert or divert any watercourses.

Regards

Colin Worswick

Development and Flood Risk Engineer
North Area, North West Region
01772 714259
07741 019565

From: stewart.griffiths@amec.com [mailto:stewart.griffiths@amec.com]
Sent: 20 March 2012 14:28
To: Worswick, Colin
Subject: 31936 - Land at Higher Standon, Clitheroe - FRA

FAO: Colin Worswick

I understand that you cover the Clitheroe Area.

We are undertaking a Flood Risk Assessment for a couple of development sites in Clitheroe - see attached layout plan(s).

a) **Site 1 - 4 Acre Site**(Post Code BB7 1HF)

The site is located between Little Moor and Little Moor View as indicated by the attached plan.

b) **Site 2 - Main Development Site**(covering an area of approx 70 ha)

Located to the east of Little Moor Road, as indicated on the Drawing.

Could you advise me whether there are any flooding restrictions on this site, for our inclusion in our Flood Risk Assessment Report?
We understand that the site is located in a Flood Zone 1 Area, but could you confirm this.

Any queries then contact me on the number below.

Regards

Stewart Griffiths
Senior Civil Engineer
AMEC
Amec Environment & Infrastructure UK Limited
Windsor House, Gadbrook Road Northwich CW9 7TN UK
Tel +99 (0)1606 354800
Direct +44 (0)1606 354812 mobile +44(0)7896 213922
stewart.griffiths@amec.com
amec.com/ukenvironment

----- Forwarded by Stewart Griffiths/NOR/ENTEC/NWG on 20/03/2012 14:03 -----

From: 'Welsby Cliff <cliff welsby@environment-agency gov uk>
To: stewart griffiths@amec com' <stewart griffiths@amec com>
Date: 15/03/2012 12:15
Subject: RE: 31936 - Land at Higher Standon. Clitheroe - FRA

Stewart

Colin Worswick is the engineer for Clitheroe area.

Tel. 07741 019565

Cliff

From: stewart.griffiths@amec.com [mailto:stewart.griffiths@amec.com]
Sent: 14 March 2012 10:08
To: Welsby, Cliff
Cc: Carter, Philip A; andrew.worsdale@amec.com
Subject: 31936 - Land at Higher Standon, Clitheroe - FRA

Hi Cliff,

We have a couple of Greenfield sites in Clitheroe where we have been asked to undertake an Outline FRA.

Who is the EA contact for this area?

Regards

Stewart Griffiths
Senior Civil Engineer
AMEC
Amec Environment & Infrastructure UK Limited
Windsor House, Gadbrook Road Northwich CW9 7TN, UK
Tel +99 (0)1606 354800
Direct +44 (0)1606 354812 mobile +44(0)7896 213922
stewart.griffiths@amec.com
amec.com/ukenvironment

From:	"Welsby, Cliff' <cliff welsby@environment-agency gov uk>
To:	stewart griffiths@amec com" <stewart griffiths@amec com>
Cc:	'Carter, Philip A' <PCARTER@environment-agency gov uk>
Date:	07/03/2012 10:28
Subject:	RE: 31936 - Site at Lightfoot Lane Fulwood, Preston - FRA

Stewart

As detailed by Philip on site attenuation will be required for surface water at existing "green field" rates usually considered to be 10l/sec/hec
Any works to the culverted watercourse may require Agency formal consent.
Please contact me again should you need to apply for any consents.

Regards

Cliff.

From: stewart.griffiths@amec.com [mailto:stewart.griffiths@amec.com]
Sent: 07 March 2012 09:59

To: Welsby, Cliff
Cc: andrew.worsdale@amec.com; sammy.spaine@amec.com
Subject: 31936 - Site at Lightfoot Lane, Fulwood, Preston - FRA

Cliff,

Further to Phil Carter's e:mail below, are you aware of any site specific issues for the site at Lightfoot Lane (location plan attached) which will need to be included in the FRA?

Many Thanks

Stewart Griffiths
Senior Civil Engineer
AMEC
Amec Environment & Infrastructure UK Limited
Windsor House, Gadbrook Road Northwich CW9 7TN UK
Tel +99 (0)1606 354800
Direct +44 (0)1606 354812 mobile +44(0)7896 213922
stewart.griffiths@amec.com
amec.com/ukenvironment

----- Forwarded by Stewart Griffiths/NOR/ENTEC/NWG on 07/03/2012 09:53 -----

From:	Carter Philip A' <PCARTER@environment-agency gov uk>
To:	stewart griffiths@amec com <stewart griffiths@amec com>
Cc:	'Welsby Cliff' <cliff.welsby@environment-agency gov uk>
Date:	07/03/2012 09:47
Subject:	RE: 31936 - Site at Lightfoot Lane Fulwood Preston - FRA

Stewart

The engineer who covers the area is Cliff Welsby - you can contact him directly on 01772 714016 but I've also copied him into this e-mail.

I can confirm that the area is Flood Zone 1 and any development must ensure that surface water run-off from the site is restricted to existing rates (to be identified in the FRA). From the OS map of the area, there is an ordinary watercourse flowing through the site in a northerly direction, under the motorway, in culvert The risk of flooding due to blockage or under capacity of the watercourses and culverts on site will need to be considered in the FRA, as will the potential for removal of any culverts that could reduce flood risk.

I would recommend contacting Cliff to see if he has any other site specific issues that would need to be considered in the FRA. Kind regards

Philip

Philip Carter
Planning Liaison Officer
Environment Agency
PO Box 519
South Preston
PR5 8GD
01772 714219

Flooding data Request - Standen Road, Clitheroe

Finch, Peter to richard.breakspear 14/02/2012 14:42

Richard,

Thank you for your Email dated 13th.February 2012.

There are no major recorded flooding incidents on Standen Road, except for the occasional blocked gully that can cause a localised flooding problem.

Regards
Peter Finch
Principal Engineer (Ribble Valley)
Environment Services East
Lancashire County Council
01254 770960

RE: Sewer flooding data request , site at Standen, Clitheroe, Lancashire

Planning Liaison to richard breakspear 20/02/2012 12:23

Hello Richard

Information as requested

DG5 Sewer Flooding

I have checked our records and have found a DG5 flooding issues within the immediate vicinity of the proposed development The reported issue is on Turner Street, Clitheroe.

Please note that United Utilities Water plc (UUW) can only record and check flooding events which are reported to us and we have to comply with our Regulators instructions on the qualification of flooding events to place on the 'at risk' register.

This assesment does not include any sewer flooding events caused by blockages or collapses which are the result of third party actions, natural events or other actions over which UUW has no control and not a facet of sewer capacity

If I can be of any further assistance in the meantime then please don't hesitate to get in touch.
Regards
Graham Perry

From: richard.breakspear@amec.com [mailto:richard.breakspear@amec.com]
Sent: 13 February 2012 10:15
To: Planning Liaison
Subject: Sewer flooding data request, site at Standen, Clitheroe, Lancashire

Hi,

I would like to request information on past/existing incidences of sewer flooding in support of a Flood Risk Assessment being prepared for a residential development site at Standen, Clitheroe, Lancashire.

I've checked on your website, under Developer Enquiries (http://www.unitedutilities.com/Wastewaterconnections.aspx) and cannot find a link to the information I require.

The site is immediately west of the A59, (see attached plan). The approximate grid reference for the centre of the area of interest is: SD 74917 40684
Or see:
http://gridreferencefinder.com/?gr=SD7491740684%7CPoint_s_E%7C0&z=15&v=h&t=Point_s_E

Best regards,

Richard

Dr Richard Breakspear

Dawson, Emily

From: Griffiths, Stewart on behalf of Dawson, Emily
Sent: 26 March 2012 10:13
To: Dawson, Emily
Subject: 29421 - Land at Higher Standon, Clitheroe, Lancs

Note the response I received from UU last week, for your information.

Regards

Stewart Griffiths
Senior Civil Engineer
AMEC
Amec Environment & Infrastructure UK Limited Windsor House, Gadbrook Road, Northwich CW9 7TN, UK Tel +99 (0)1606 354800 Direct +44 (0)1606 354812 mobile +44(0)7896 213922 stewart.griffiths@amec.com amec.com/ukenvironment

----- Forwarded by Stewart Griffiths/NOR/ENTEC/NWG on 26/03/2012 10:13 -----

From:	"Perry, Graham" <Graham.Perry@uuplc.co.uk>
To:	<stewart.griffiths@amec com>
Date:	19/03/2012 16:21
Subject:	RE: 29421 - Land at Higher Standon, Clitheroe, Lancs

Hello Stewart

Further to our discussion, I can confirm that we would accept free foul discharge from 50 domestic units into the 300mm combined sewer crossing the site but we would not accept any surface water. Under the terms of Building regulation H3 & PPS25, you must discharge to either soakaway on site or to the nearby watercourse

We would have no objection to you diverting the existing 300mm combined sewer that crosses the site providing that you enter into a Section 185 Diversion agreement before starting.

"United Utilities Water plc (UUW) will provide information on connection points and maximum permitted discharge rates to public sewers in response to enquiries by developers and in response to Planning Applications where Planning Authorities have elected to consult UUW on drainage matters.

However, the points of connection and discharge rates cannot be allocated and reserved for a particular development. UUW reserves the right to revise the connection point and discharge rate current at the time that a formal application for connection to public sewer is made, in order to take account of possible changes in discharges to the public sewer between the date of the enquiry and the date of the connection being required".

Regards

Graham Perry

From: stewart.griffiths@amec.com [mailto:stewart.griffiths@amec com]
Sent: 13 March 2012 13:17
To: Perry, Graham
Subject: 29421 - Land at Higher Standon, Clitheroe, Lancs

Graham,

FYI

I don't think you received this drawing last time!

Regards

Stewart Griffiths
Senior Civil Engineer
AMEC
Amec Environment & Infrastructure UK Limited Windsor House, Gadbrook Road, Northwich CW9 7TN, UK Tel +99 (0)1606 354800 Direct +44 (0)1606 354812 mobile +44(0)7896 213922 stewart griffiths@amec.com
amec.com/ukenvironment

----- Forwarded by Stewart Griffiths/NOR/ENTEC/NWG on 13/03/2012 13:20

From: Stewart Griffiths/NOR/ENTEC/NWG

To: "Perry, Graham" <Graham.Perry@uuplc.co.uk>

Date: 13/03/2012 13:09

Subject: 29421 - Land at Higher Standon, Clitheroe, Lancs

Hello Stewart,

My initial thoughts would be that this is a significant development that will have a major impact to our network and receiving treatment works.

Surface Water

All surface water from this site must be drained directly soakaway / SUDS or to the watercourses running through the site. You will need to discuss your proposals with the EA to agree discharge points / flow rates

Foul

We are currently carrying out a detailed assessment of the area and we should know the impact that your site has to our assets in the near future.
For your purposes I would suggest that will be capacity issues on the network & treatment works.

Regards

Graham Perry

From: stewart.griffiths@amec.com [mailto:stewart.griffiths@amec.com]
Sent: 05 January 2012 16:34
To: Perry, Graham
Subject: 29421 - Land at Higher Standon, Clitheroe, Lancs

Hi Graham,

Happy New Year!

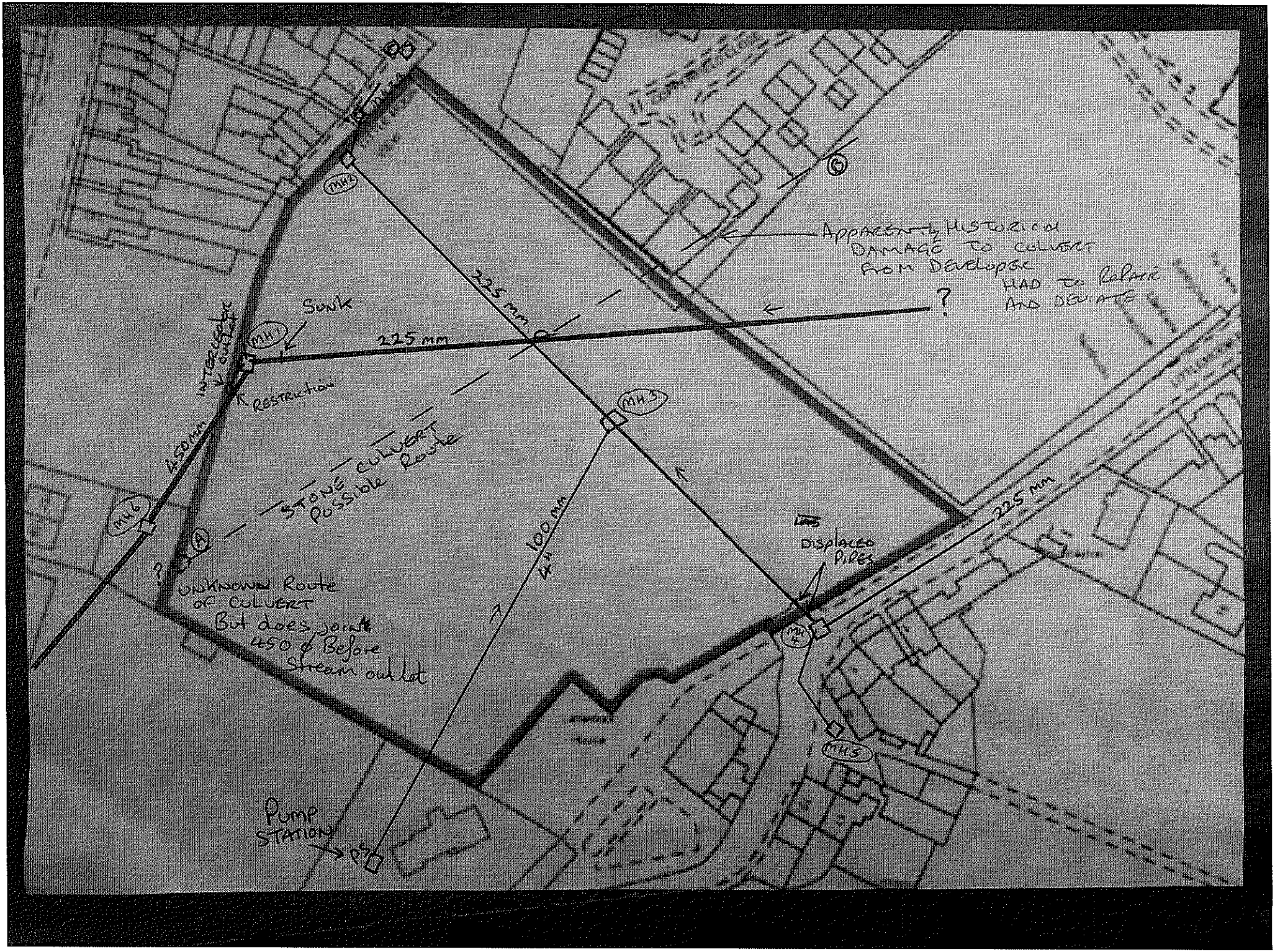
We have a site in your area which we are assessing from a drainage capacity point of view.

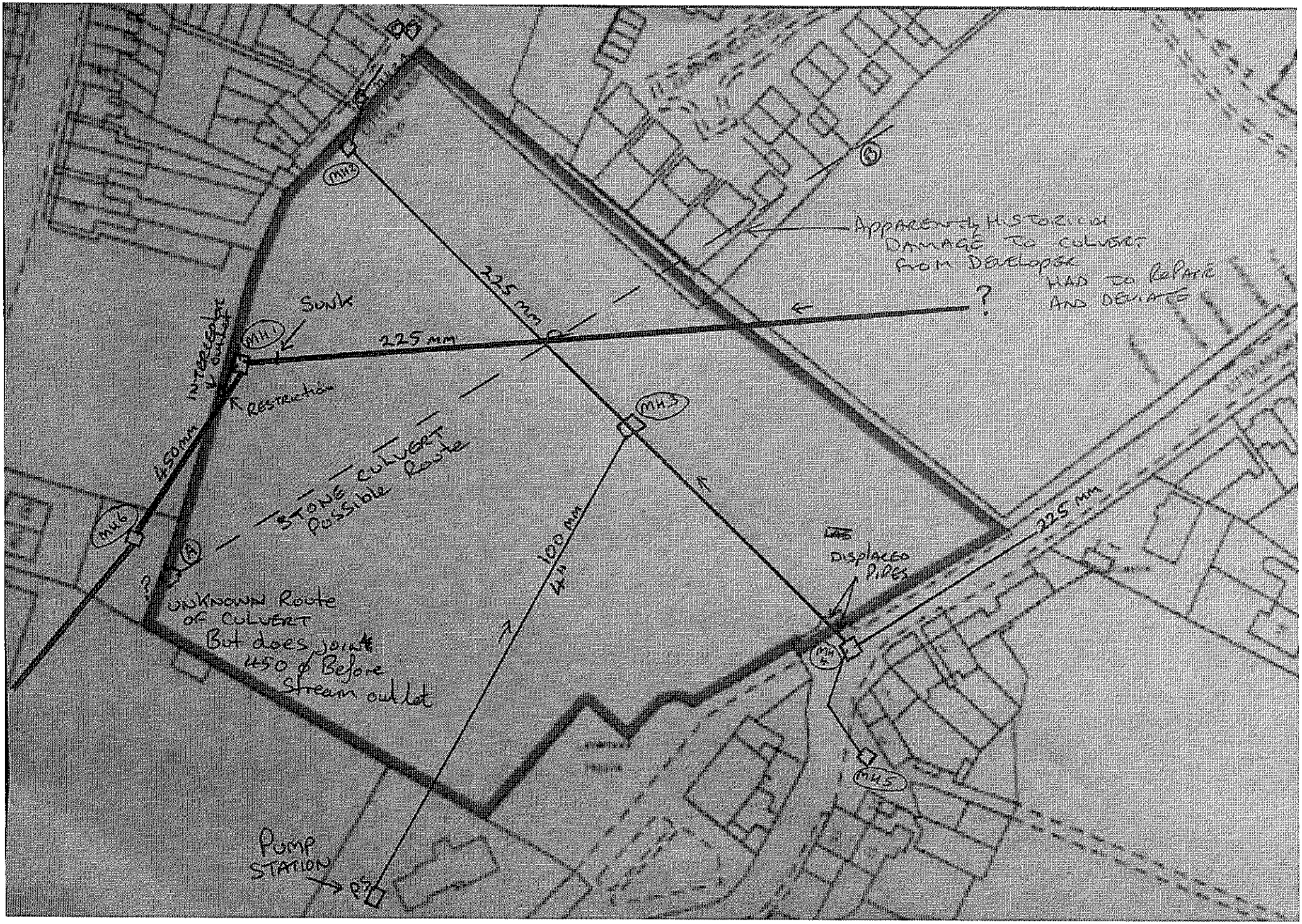
The location of the site is attached (Postcode BB7 1PP) for your information, which is located to the South East of Clitheroe.

We are in the process of requesting Sewer Record information from UU

Anticipated development will consist of approx 1040 residential properties and 7500 m2 of office space

Could you advise me on the capacity of the local sewerage systems to accommodate such a development?


MH2
MH1
MH3
MH4
MH5
MH6
225 mm
225 mm
225 mm
450 mm
100 mm
Sunk
Intercepted outlet
Restriction
Stone culvert Possible Route
Unknown Route of Culvert But does joint 450 & Before Stream outlet
Displaced Pipes
Apparently historical damage to culvert from developer had to replace and dig up
Pump Station
PS
?
?


MH2
MH1
MH3
MH4
MH5
MH6
225 mm
SINK
INTERCEPTOR
RESTRICTION
450mm
STONE CULVERT
Possible Route
UNKNOWN Route
of CULVERT
But does joint
450 of Before
Stream outlet
100 mm
225 mm
APPARENTLY HISTORICAL
DAMAGE TO CULVERT
FROM DEVELOPER
HAD TO REPAIR
AND DEVIATE
?
DISPLACED
PIPES
PUMP
STATION
PS

Existing Network Details for Storm

* - Indicates pipe has been modified outside of System 1

	PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
*	1.000	29.833	0.195	153.0	0.050	5.00	0.600	o	225
*	1.001	30.463	0.202	150.8	0.144	0.00	0.600	o	225
*	2.000	17.692	0.246	71.9	0.042	5.00	0.600	o	225
*	3.000	26.019	0.171	152.2	0.036	5.00	0.600	o	225
*	2.001	22.361	1.454	15.4	0.050	0.00	0.600	o	225
*	4.000	28.460	0.050	569.2	0.025	5.00	0.600	o	225
*	2.002	22.825	0.164	139.2	0.029	0.00	0.600	o	225
*	2.003	23.022	0.166	138.7	0.069	0.00	0.600	o	225
*	2.004	17.117	0.123	139.2	0.081	0.00	0.600	o	225
*	2.005	14.142	0.102	138.6	0.088	0.00	0.600	o	300
*	2.006	14.142	0.102	138.6	0.070	0.00	0.600	o	300
*	2.007	33.242	0.240	138.5	0.067	0.00	0.600	o	300
*	1.002	5.000	0.338	14.8	0.139	0.00	0.600	o	300
*	1.003	36.125	0.965	37.4	0.000	0.00	0.600	o	450

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
* 1.000	SW01	79.800	78.375	1.200	79.500	78.180	1.095		1200
* 1.001	SW02	79.500	78.180	1.095	78.800	77.978	0.597		1200
* 2.000	SW03	82.000	80.575	1.200	81.700	80.329	1.146		1200
* 3.000	SW04	81.700	80.500	0.975	81.700	80.329	1.146		1200
* 2.001	SW05	81.700	80.329	1.146	80.500	78.875	1.400		1200
* 4.000	SW06	80.300	78.925	1.150	80.500	78.875	1.400		1200
* 2.002	SW07	80.500	78.875	1.400	79.800	78.711	0.864		1200
* 2.003	SW08	79.800	78.711	0.864	79.800	78.545	1.030		1200
* 2.004	SW09	79.800	78.545	1.030	79.000	78.422	0.353		1200
* 2.005	SW10	79.000	78.347	0.353	79.000	78.245	0.455		1200
* 2.006	SW11	79.000	78.245	0.455	79.000	78.143	0.557		1200
* 2.007	SW12	79.000	78.143	0.557	78.800	77.903	0.597		1200
* 1.002	SW13	78.800	77.903	0.597	78.800	77.565	0.935	Hydro-Brake®	1200
* 1.003	PW03	78.800	77.565	0.785	78.100	76.600	1.050		1200

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	I	Min Level (m)	D,L (mm)	W (mm)
1.003	Ex MH	78.100	76.600		0.000	450	0

Simulation Criteria for Storm

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 Coeffiecient	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 Storage Structures	13
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	1
Site Location GB 373850 440650 SD 73850 40650	
C (1km)	-0.025
D1 (1km)	0.398
D2 (1km)	0.385
D3 (1km)	0.430
E (1km)	0.299
F (1km)	2.444
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

Online Controls for Storm

Hydro-Brake® Manhole: SW13, DS/PN: 1.002, Volume (m³): 4.4

Design Head (m) 0 800 Hydro-Brake® Type Md4 Invert Level (m) 77.903
Design Flow (l/s) 8.9 Diameter (mm) 112

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.3	1.200	10.7	3.000	16.9	7.000	25.9
0.200	8.0	1.400	11.6	3.500	18.3	7.500	26.8
0.300	7.8	1.600	12.4	4.000	19.6	8.000	27.6
0.400	6.9	1.800	13.1	4.500	20.7	8.500	28.5
0.500	7.1	2.000	13.8	5.000	21.9	9.000	29.3
0.600	7.6	2.200	14.5	5.500	22.9	9.500	30.1
0.800	8.7	2.400	15.1	6.000	23.9		
1.000	9.8	2.600	15.8	6.500	24.9		

Storage Structures for Storm

Porous Car Park Manhole: SW01, DS/PN: 1.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	4.2
Membrane Percolation (mm/hr)	1	Length (m)	30.0
Max Percolation (l/s)	0.0	Slope (1:X)	153.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.375	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW02, DS/PN: 1.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	30.4
Max Percolation (l/s)	0.0	Slope (1:X)	151.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.180	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW03, DS/PN: 2.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	36.0
Max Percolation (l/s)	0.1	Slope (1:X)	72.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	80.575	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW04, DS/PN: 3.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	4.2
Membrane Percolation (mm/hr)	1	Length (m)	26.0
Max Percolation (l/s)	0.0	Slope (1:X)	152.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	80.500	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW05, DS/PN: 2.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	22.5
Max Percolation (l/s)	0.0	Slope (1:X)	15.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	80.329	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW06, DS/PN: 4.000

Infiltration Coefficient Base (m/hr)	0.00000	Safety Factor	2.0
Membrane Percolation (mm/hr)	1	Porosity	0.30
Max Percolation (l/s)	0.0	Invert Level (m)	78.925

Porous Car Park Manhole: SW06, DS/PN: 4.000

Width (m)	4.2	Depression Storage (mm)	5
Length (m)	28.5	Evaporation (mm/day)	3
Slope (1:X)	569.0	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW07, DS/PN: 2.002

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	22.8
Max Percolation (l/s)	0.0	Slope (1:X)	139.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.875	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW08, DS/PN: 2.003

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	23.0
Max Percolation (l/s)	0.0	Slope (1:X)	139.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.711	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW09, DS/PN: 2.004

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	17.1
Max Percolation (l/s)	0.0	Slope (1:X)	139.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.545	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW10, DS/PN: 2.005

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	14.1
Max Percolation (l/s)	0.0	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.347	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW11, DS/PN: 2.006

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	14.1
Max Percolation (l/s)	0.0	Slope (1:X)	139.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.245	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW12, DS/PN: 2.007

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	33.0
Max Percolation (l/s)	0.1	Slope (1:X)	139.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.143	Cap Volume Depth (m)	0.000

Cellular Storage Manhole: SW13, DS/PN: 1.002

Invert Level (m)	77.903	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	700.0	450.0	1.300	0.0	530.6
0.100	700.0	458.5	1.400	0.0	530.6
0.200	700.0	467.0	1.500	0.0	530.6
0.300	700.0	475.5	1.600	0.0	530.6
0.400	700.0	483.9	1.700	0.0	530.6
0.500	700.0	492.4	1.800	0.0	530.6
0.600	700.0	500.9	1.900	0.0	530.6
0.700	700.0	509.4	2.000	0.0	530.6
0.800	700.0	517.9	2.100	0.0	530.6
0.900	700.0	526.4	2.200	0.0	530.6
1.000	700.0	530.6	2.300	0.0	530.6
1.100	0.0	530.6	2.400	0.0	530.6
1.200	0.0	530.6	2.500	0.0	530.6

Summary of Critical Results by Maximum Level (Rank 1) for Storm

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DIS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30
Climate Change (%)	0, 0

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act	Lvl Exc
1.000	15 Winter	30	0%					
1.001	15 Winter	30	0%	30/15 Summer				
2.000	15 Winter	30	0%					
3.000	15 Winter	30	0%					
2.001	15 Winter	30	0%					
4.000	15 Winter	30	0%					
2.002	15 Winter	30	0%					
2.003	15 Winter	30	0%	30/15 Summer				
2.004	15 Winter	30	0%	30/15 Summer				
2.005	15 Winter	30	0%					
2.006	15 Winter	30	0%					
2.007	30 Winter	30	0%					
1.002	720 Winter	30	0%	30/60 Winter				
1.003	2880 Summer	30	0%					

PN	US/MH Name	Water Level (m)	Surch'ed Depth (m)	Flooded Volume (m^3)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
1.000	SW01	78.480	-0.120	0.000	0.43	0.0	16.8	OK
1.001	SW02	78.445	0.040	0.000	1.12	0.0	44.1	SURCHARGED
2.000	SW03	80.656	-0.144	0.000	0.28	0.0	15.3	OK
3.000	SW04	80.587	-0.138	0.000	0.31	0.0	12.2	OK
2.001	SW05	80.426	-0.128	0.000	0.37	0.0	45.0	OK
4.000	SW06	79.071	-0.079	0.000	0.41	0.0	8.2	OK
2.002	SW07	79.088	-0.012	0.000	0.93	0.0	37.3	OK
2.003	SW08	78.980	0.044	0.000	0.96	0.0	38.9	SURCHARGED
2.004	SW09	78.830	0.060	0.000	1.25	0.0	49.2	SURCHARGED
2.005	SW10	78.588	-0.059	0.000	0.84	0.0	65.6	OK
2.006	SW11	78.518	-0.027	0.000	1.00	0.0	78.3	OK
2.007	SW12	78.393	-0.050	0.000	1.00	0.0	86.4	OK
1.002	SW13	78.357	0.154	0.000	0.05	0.0	7.9	SURCHARGED
1.003	PW03	77.601	-0.414	0.000	0.02	0.0	7.9	OK

Existing Network Details for Storm

* - Indicates pipe has been modified outside of System 1

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
* 1.000	29.833	0.195	153.0	0.050	5.00	0.600	o	225
* 1.001	30.463	0.202	150.8	0.144	0.00	0.600	o	225
* 2.000	17.692	0.246	71.9	0.042	5.00	0.600	o	225
* 3.000	26.019	0.171	152.2	0.036	5.00	0.600	o	225
* 2.001	22.361	1.454	15.4	0.050	0.00	0.600	o	225
* 4.000	28.460	0.050	569.2	0.025	5.00	0.600	o	225
* 2.002	22.825	0.164	139.2	0.029	0.00	0.600	o	225
* 2.003	23.022	0.166	138.7	0.069	0.00	0.600	o	225
* 2.004	17.117	0.123	139.2	0.081	0.00	0.600	o	225
* 2.005	14.142	0.102	138.6	0.088	0.00	0.600	o	300
* 2.006	14.142	0.102	138.6	0.070	0.00	0.600	o	300
* 2.007	33.242	0.240	138.5	0.067	0.00	0.600	o	300
* 1.002	5.000	0.338	14.8	0.139	0.00	0.600	o	300
* 1.003	36.125	0.965	37.4	0.000	0.00	0.600	o	450

PN	US/MH Name	US/CL (m)	US/IL (m)	US C Depth (m)	DS/CL (m)	DS/IL (m)	DS C Depth (m)	Ctrl	US/MH (mm)
* 1.000	SW01	79.800	78.375	1.200	79.500	78.180	1.095		1200
* 1.001	SW02	79.500	78.180	1.095	78.800	77.978	0.597		1200
* 2.000	SW03	82.000	80.575	1.200	81.700	80.329	1.146		1200
* 3.000	SW04	81.700	80.500	0.975	81.700	80.329	1.146		1200
* 2.001	SW05	81.700	80.329	1.146	80.500	78.875	1.400		1200
* 4.000	SW06	80.300	78.925	1.150	80.500	78.875	1.400		1200
* 2.002	SW07	80.500	78.875	1.400	79.800	78.711	0.864		1200
* 2.003	SW08	79.800	78.711	0.864	79.800	78.545	1.030		1200
* 2.004	SW09	79.800	78.545	1.030	79.000	78.422	0.353		1200
* 2.005	SW10	79.000	78.347	0.353	79.000	78.245	0.455		1200
* 2.006	SW11	79.000	78.245	0.455	79.000	78.143	0.557		1200
* 2.007	SW12	79.000	78.143	0.557	78.800	77.903	0.597		1200
* 1.002	SW13	78.800	77.903	0.597	78.800	77.565	0.935	Hydro-Brake®	1200
* 1.003	PW03	78.800	77.565	0.785	78.100	76.600	1.050		1200

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C Level I (m)	Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1 003	Ex MH	78 100	76 600	0 000	450	0

Simulation Criteria for Storm

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

Number of Input Hydrographs	0	Number of Storage Structures	13
Number of Online Controls	1	Number of Iime/Area Diagrams	0
Number of Offline Controls	0	Number of Real Iime Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	1
Site Location	GB 373850 440650 SD 73850 40650
C (1km)	-0.025
D1 (1km)	0.398
D2 (1km)	0.385
D3 (1km)	0.430
E (1km)	0.299
F (1km)	2.444
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

Online Controls for Storm

Hydro-Brake® Manhole: SW13, DS/PN: 1.002, Volume (m³): 4.4

Design Head (m) 0.800 Hydro-Brake® Type Md4 Invert Level (m) 77.903
Design Flow (l/s) 8.9 Diameter (mm) 112

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.3	1.200	10.7	3.000	16.9	7.000	25.9
0.200	8.0	1.400	11.6	3.500	18.3	7.500	26.8
0.300	7.8	1.600	12.4	4.000	19.6	8.000	27.6
0.400	6.9	1.800	13.1	4.500	20.7	8.500	28.5
0.500	7.1	2.000	13.8	5.000	21.9	9.000	29.3
0.600	7.6	2.200	14.5	5.500	22.9	9.500	30.1
0.800	8.7	2.400	15.1	6.000	23.9		
1.000	9.8	2.600	15.8	6.500	24.9		

Storage Structures for Storm

Porous Car Park Manhole: SW01, DS/PN: 1.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	4.2
Membrane Percolation (mm/hr)	1	Length (m)	30.0
Max Percolation (l/s)	0.0	Slope (1:X)	153.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.375	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW02, DS/PN: 1.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	30.4
Max Percolation (l/s)	0.0	Slope (1:X)	151.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.180	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW03, DS/PN: 2.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	36.0
Max Percolation (l/s)	0.1	Slope (1:X)	72.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	80.575	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW04, DS/PN: 3.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	4.2
Membrane Percolation (mm/hr)	1	Length (m)	26.0
Max Percolation (l/s)	0.0	Slope (1:X)	152.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	80.500	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW05, DS/PN: 2.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	22.5
Max Percolation (l/s)	0.0	Slope (1:X)	15.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	80.329	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW06, DS/PN: 4.000

Infiltration Coefficient Base (m/hr)	0.00000	Safety Factor	2.0
Membrane Percolation (mm/hr)	1	Porosity	0.30
Max Percolation (l/s)	0.0	Invert Level (m)	78.925

Porous Car Park Manhole: SW06, DS/PN: 4.000

Width (m)	4.2	Depression Storage (mm)	5
Length (m)	28.5	Evaporation (mm/day)	3
Slope (1:X)	569.0	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW07, DS/PN: 2.002

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	22.8
Max Percolation (l/s)	0.0	Slope (1:X)	139.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.875	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW08, DS/PN: 2.003

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	23.0
Max Percolation (l/s)	0.0	Slope (1:X)	139.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.711	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW09, DS/PN: 2.004

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	17.1
Max Percolation (l/s)	0.0	Slope (1:X)	139.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.545	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW10, DS/PN: 2.005

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	14.1
Max Percolation (l/s)	0.0	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.347	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW11, DS/PN: 2.006

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	14.1
Max Percolation (l/s)	0.0	Slope (1:X)	139.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.245	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: SW12, DS/PN: 2.007

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1	Length (m)	33.0
Max Percolation (l/s)	0.1	Slope (1:X)	139.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.143	Cap Volume Depth (m)	0.000

Cellular Storage Manhole: SW13, DS/PN: 1.002

Invert Level (m)	77.903	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	700.0	450.0	1.300	0.0	530.6
0.100	700.0	458.5	1.400	0.0	530.6
0.200	700.0	467.0	1.500	0.0	530.6
0.300	700.0	475.5	1.600	0.0	530.6
0.400	700.0	483.9	1.700	0.0	530.6
0.500	700.0	492.4	1.800	0.0	530.6
0.600	700.0	500.9	1.900	0.0	530.6
0.700	700.0	509.4	2.000	0.0	530.6
0.800	700.0	517.9	2.100	0.0	530.6
0.900	700.0	526.4	2.200	0.0	530.6
1.000	700.0	530.6	2.300	0.0	530.6
1.100	0.0	530.6	2.400	0.0	530.6
1.200	0.0	530.6	2.500	0.0	530.6

Summary of Critical Results by Maximum Level (Rank 1) for Storm

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DIS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 30

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act	Lvl Exc
1.000	720 Winter	100	+30%	100/15 Summer				
1.001	720 Winter	100	+30%	30/15 Summer				
2.000	15 Winter	100	+30%					
3.000	15 Winter	100	+30%					
2.001	15 Winter	100	+30%					
4.000	15 Winter	100	+30%	100/15 Summer				
2.002	15 Winter	100	+30%	100/15 Summer				
2.003	15 Winter	100	+30%	30/15 Summer				
2.004	15 Winter	100	+30%	30/15 Summer				
2.005	15 Winter	100	+30%	100/15 Summer				
2.006	15 Winter	100	+30%	100/15 Summer				
2.007	720 Winter	100	+30%	100/15 Summer				
1.002	720 Winter	100	+30%	30/60 Winter				
1.003	720 Winter	100	+30%					

PN	US/MH Name	Water Level (m)	Surch'ed Depth (m)	Flooded Volume (m^3)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
1.000	SW01	78.716	0.116	0.000	0.07	0.0	2.9	SURCHARGED
1.001	SW02	78.715	0.310	0.000	0.23	0.0	9.1	SURCHARGED
2.000	SW03	80.694	-0.106	0.000	0.54	0.0	29.7	OK
3.000	SW04	80.628	-0.097	0.000	0.61	0.0	23.6	OK
2.001	SW05	80.474	-0.080	0.000	0.72	0.0	87.5	OK
4.000	SW06	79.367	0.217	0.000	0.65	0.0	12.9	SURCHARGED
2.002	SW07	79.384	0.284	0.000	0.97	0.0	38.9	SURCHARGED
2.003	SW08	79.276	0.340	0.000	1.04	0.0	42.0	SURCHARGED
2.004	SW09	79.108	0.338	0.000	1.45	0.0	56.9	SURCHARGED
2.005	SW10	78.860	0.213	0.000	1.07	0.0	83.7	FLOOD RISK
2.006	SW11	78.750	0.205	0.000	1.34	0.0	105.2	FLOOD RISK
2.007	SW12	78.717	0.274	0.000	0.31	0.0	26.8	FLOOD RISK
1.002	SW13	78.710	0.507	0.000	0.06	0.0	8.8	FLOOD RISK
1.003	PW03	77.605	-0.410	0.000	0.02	0.0	8.8	OK

DESIGN/CALCULATION SHEET

Project No:	29421	**Project Title:**	4 Acre Site, Clitheroe	**Sheet:**	1 of 1
Customer Organisation:	Trustees of Standed Estates			**Date:**	20/09/12
Subject:	FOUL WATER CALCULATIONS			**Made by:**	AW

For Computer Calculations: Operation Performed:

Software Used: Version:Filename (Spreadsheet):

Data Source (Reference & Filename/Path):

Checker's Initials and date:

Ref:

Foul Water Drainage Calculations have been based on the methodology of "Sewers For Adoption - 6th Edition"

Proposed No. of dwellings = 49

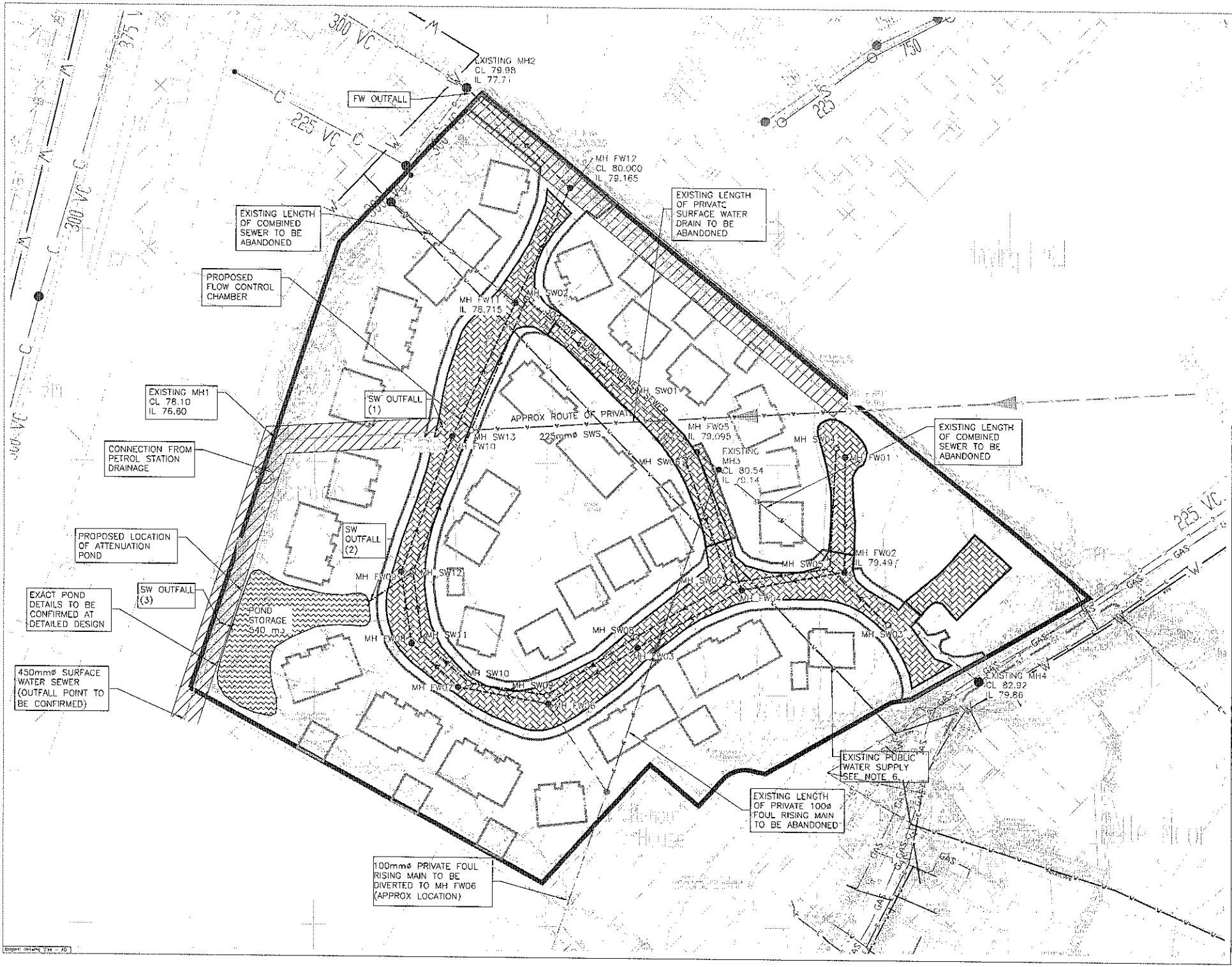
Foul flow per dwelling = 4000 l/h//d (Clause 2.12)

TOTAL FOUL FLOW = 49 x 4000

= 196,000 Litres / Day

= 2.**27 Litres / Sec**

Capacity of 300mm diameter sewer @ 1 in 116 = 91 Litres / Sec (Ks = 1.5)



DESCRIPTION

REV	DATE	DESCRIPTION	ORIG	CHK	APP
A	12/09/12	DRAFT ISSUE	JW	AN	TT

REVISIONS

REV	DATE	DESCRIPTION	ORIG	CHK	APP
B	19/09/12	MASTERPLAN AMENDED TO LOWERS CLIENT MEETING	JW	AN	TT

NOTES:

1. DO NOT SCALE FROM THIS DRAWING
2. ALL DIMENSIONS AND LEVELS IN METRES UNLESS NOTED OTHERWISE
3. TOPOGRAPHICAL SURVEY DATA OBTAINED FROM SURVEY OPERATIONS, DATED JULY 2011.
4. ALL SERVICES SHOWN ARE INDICATIVE ONLY. IT IS THE CONTRACTORS RESPONSIBILITY TO CONFIRM LOCATIONS BEFORE ANY WORK IS UNDERTAKEN.
5. THE SERVICES INFORMATION OBTAINED FROM THE STATUTORY SERVICE PROVIDERS HAS NOT BEEN VALIDATED BY AMEC. FUTURE USERS OF THIS PLAN MUST ENSURE THAT THE ACCURACY OF THE INFORMATION IS CHECKED & PROVEN.
6. EXISTING PUBLIC WATER SUPPLY TO BE DIVERTED BY UNITED UTILITIES.

LEGEND:

- 4 ACRES SITE BOUNDARY
- EXISTING UNDERGROUND BT
- EXISTING OVERHEAD BT
- EXISTING UNDERGROUND TELECOMS
- GAS — EXISTING GAS PIPE
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- W — EXISTING WATER SUPPLY
- EXISTING SURFACE WATER SEWER
- EXISTING FOUL WATER SEWER
- EXISTING COMBINED WATER SEWER
- EXISTING SURFACE WATER DRAIN
- PROPOSED SURFACE WATER SEWER
- PROPOSED FOUL WATER SEWER
- PROPOSED ABANDONED SEWER
- PROPOSED PERMEABLE PAVING WITH UNDER STONE STORAGE
- PROPOSED SURFACE WATER STORAGE POND
- PROPOSED 6m EASEMENT

SCALES 1:250 @ A0

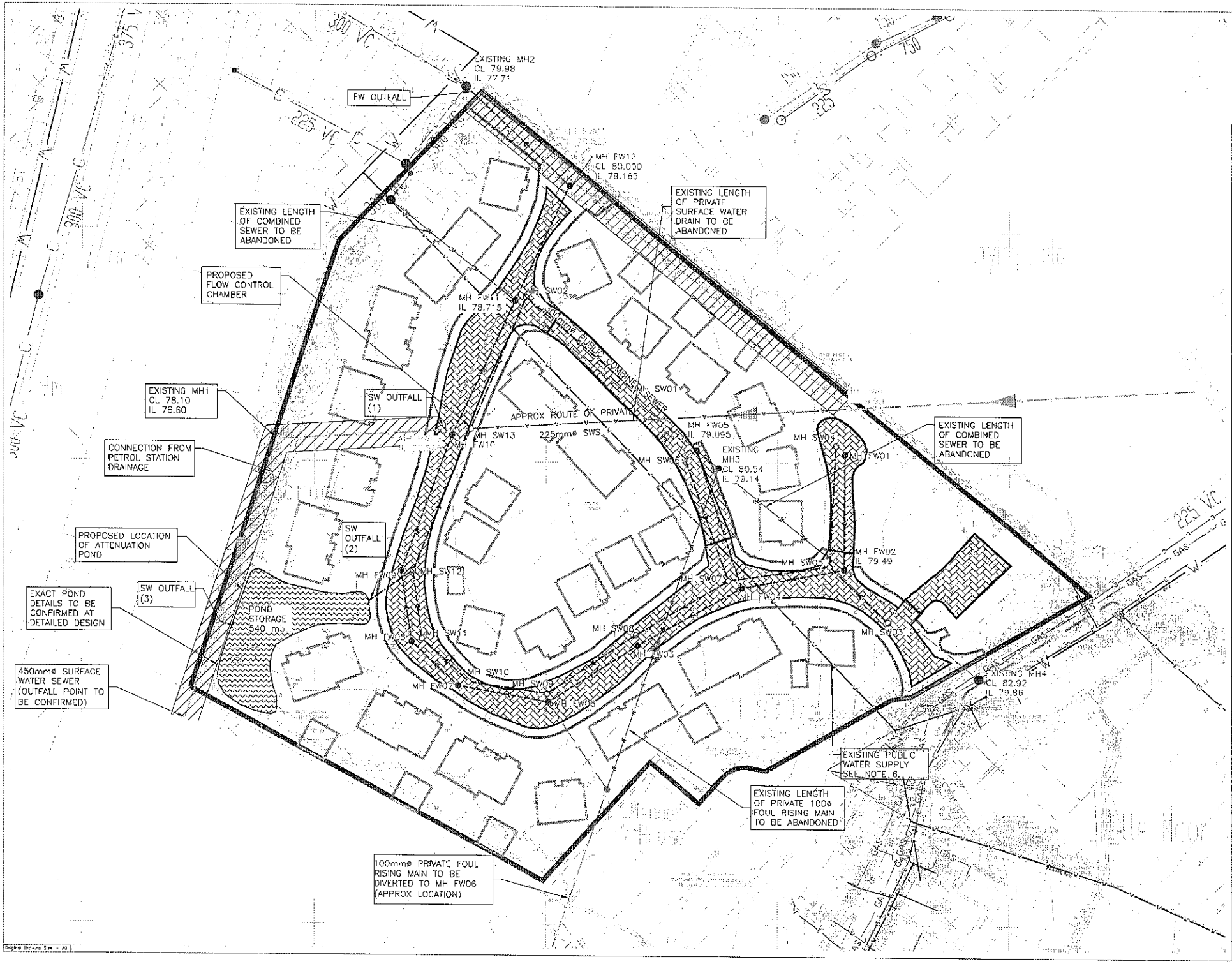
PROJECT TITLE:
CLITHEROE
4 ACRE SITE

DRAWING TITLE:
CONSTRAINTS PLAN
PREFERRED OPTION

CLIENT:
TRUSTEES OF STANDEN ESTATES

amec

DRAWING NO.
20421/N/CVD/109 9



DESCRIPTION

REV	DATE	DRAWN	CHK	APP
A	15/08/2012	DRAFT ISSUE	AP	TS

REVISIONS

REV	DATE	DRAWN	CHK	APP
B	27/09/2012	MASTERPLAN AMENDED FOLLOWING CLIENT MEETING	AP	GA

NOTES:

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SCALES: 1:250 @ A1

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DRAWING No.
29421/N/CVD/109 B

Original Drawing Size - A1