The Alan Johnston Partnership

Flood Risk Assessment



Beswick, Phase 3

Ironside Farrar Limited
3 Worsley Court
High Street
Worsley
Manchester
M28 3NJ

30008/SRG

October 2013

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BESWICK DEVELOPMENT, PHASE 3
MANCHESTER
FLOOD RISK ASSESSMENT

1.0 Introduction

Lovell Partnerships intends to undertake a residential development consisting of up to 125no. residential units on a cleared site located off Rylance Sreet of Beswick in East Manchester. The proposed development is the latest phase of an ongoing redevelopment of the East Manchester area.

The Environment Agency Flood Map indicates the site is situated in Flood Zone 1 with a chance of flooding of less than 0.1% (or 1 in 1000) but as the site is greater than 1ha in area, a Flood Risk Assessment, in accordance with the National Planning Policy Framework is required to ensure the development is undertaken in a safe manner and to ensure the development will not increase the risk of flooding to other areas due to the development. Reference to the Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA, prepared by JBA Consulting in May 2010, reveals the site to be within the Conurbation Core Critical Drainage Area (CDA); this has implications for the surface water drainage of new developments.

2.0 Site Description

The site consists of an existing cleared housing site in the Beswick area of East Manchester that is bounded by Rylance Street to the west, Myrtle Street to the north, Blackrock Street to the east and existing development to the south. The site is located some 2.5km to the east of Manchester city centre; the Location and Site plan are included in Appendices A and B.

The existing site plans indicate the development site has previously been occupied by housing that has been demolished; there is still evidence of the previous development on the site in the form of hard standings, paths and access roads although the house foundations appear to have been removed. The site has then been levelled and left with a combination of rough grass and more formal landscaped areas. Towards the centre of the site there is a slightly raised mound area with existing trees but the remainder of the site is generally at the same level with a constant fall from north to south.

Along the southern boundary, there is a previous phase of the redevelopment, across the access road. To the west side of Rylance Street there is also earlier phases of the redevelopment and to the north west the development is ongoing. Myrtle Street forms the northern boundary of the site and beyond it there is the new Ashbury Meadow Primary School. The eastern boundary of the site is formed by a combination of Blackrock Street and Wynne Close; to the east of Blackrock Street there is existing residential development and in the south of the site the rear gardens of the houses on Wynne Close. There are further cleared sites to the south of Manipur Street that will soon undergo redevelopment, including the realignment of Wynne Close where it meets Manipur Street.

As detailed above, the general fall of the site is from north to south from Myrtle Street where the levels vary from 53.57m at the junction with Rylance Street in the north west up to 54.46m at the junction with Blackrock Street in the north east. On Rylance Street, to the south west of the site the level is 51.90m and Bell Crescent to the extreme south of the site is at a level of 51.70m. To the east of the site, at Manipur Street, the level is 52.87m; as detailed previously there is a raised mound in the centre of the site that reaches a maximum level of 55.30m. Beyond the site, the levels continue to fall to the south to Bell Crescent and Ashton Old Road.

A selection of photographs, together with an aerial photo is included in Appendix C to illustrate the site at the present day and the topographical survey is included in Appendix D.

3.0 Forms of Flooding

The Technical Guidance to the National Planning Policy Framework requires all forms of flooding to be considered.

3.1 Flooding from Rivers

The Environment Agency Flood Risk map is included as Appendix E1.

It can be seen from the map that the site is located in Flood Zone 1 with a chance of flooding of less than 0.1% (or 1 in 1000). There are no open watercourses in the vicinity of the site.

Consultation with Manchester CC indicates there is no history of flooding in the vicinity of the site and that the site is in close proximity to a culverted tributary of the River Medlock to the North West and the culverted Black Brook to the South East of the site. Both of these watercourses are classed as Ordinary Watercourses. The exact routes of the watercourses are unknown due to their culverted nature so the layout plan should be regarded as indicative only. A site walkover does not reveal any evidence of these culverted ordinary watercourses and there has been significant redevelopment in the area that would have located the culvert crossing the area and it is assumed the presence of the culvert should be treated with some caution. The location of either watercourse is such that they would not be a flood risk to the site.

The site is therefore not at risk of flooding from rivers.

3.2 Flooding from the Sea

This is covered in Section 3.1 above.

3.3 Flooding from Land

Intense rainfall, often of short duration, that is unable to soak into the ground or enter drainage systems can run quickly off land and result in local flooding. The consultation with Manchester CC indicates the site is within a known area susceptible to surface water flooding and reference should be made to the Manchester City Council SFRA for further details.

The site is surrounded by existing highways that will generally be retained; should any surface flooding occur it would be intercepted by the highway corridor and directed past the site.

The site is therefore not considered to be at significant risk of flooding as a result of run-off from adjacent land.

Reference should also be made to section 4 relating to the site drainage.

3.4 Flooding from Groundwater

During the walkover survey there was little evidence that the site exhibited water logging and the levels are such that there are no low spots within the site.

The levels will also be raised slightly above existing and it is therefore considered the site will unlikely to be at risk of flooding from groundwater.

3.5 Flooding from Sewers

The record of Public Sewers has been obtained from United Utilities and is included in Appendix F. United Utilities have been consulted with respect to flooding incidents relating to the site from the public sewers (Appendix G) but as yet no response has been received.

The records indicate there are a number of public sewers crossing or adjacent to the site; there is a 375mm dia. combined sewer running from north to south in Rylance Street that has several foul and surface water sewer connections from the site. There are also existing foul and surface water sewers crossing the centre of the site from north to south from Myrtle Street to Bell Crescent and connecting to the combined sewer in Bell Crescent that was diverted in an earlier phase of redevelopment. A 375mm dia. combined sewer enters the site at Manipur Street from Blackrock Street and runs along the south east boundary to Bell Crescent.

As the development will alter the highway pattern significantly it is likely there will be sewer abandonments and diversions required to the existing sewer network.

The site is therefore not considered to be at significant risk of flooding from sewers.

3.6 Flooding from Reservoirs, Canals and Other Artificial Sources

There are no artificial sources of flood risk in the vicinity of the site.

4.0 Development and Drainage

In line with common practice, it is proposed the surface water discharge from the proposed development should mimic those from the existing site. The comments contained in the Level 2 SFRA User Guide should be followed in relation to drainage for new developments in Critical Drainage Areas:-

- *Development should aim to deliver Greenfield runoff on Greenfield sites up to a 1 in 100 year storm event, considering climate change.*
- *Development should aim for a minimum reduction in surface water runoff rates of 50% for Brownfield sites, with an aim of reducing runoff to Greenfield rates up to a 1 in 100 year storm event, considering climate change.*

- *Development should be designed so that there is no flooding to the development in a 1 in 30 year event and so that there is no property flooding in a 1 in 100 year plus climate change event.*

The development is a Brownfield site and it is proposed, therefore, that the discharge from the proposed development will be reduced by 50% and attenuation incorporated in the surface water drainage.

As detailed above, the highway layout for the development will be significantly different than the existing and the existing sewers will need to be diverted and amended to suit the new layout.

A comparison between the existing and proposed impermeable areas has been made using the topographical survey and the existing site plan.

The results are summarised below and detailed in Appendix I:-

Development Site Area(ha)	Existing Impermeable Area (ha)	Proposed Impermeable Area (ha)	Ex. 2yr Flow (50%)
3.124	1.964	1.956	273(136.5)

Note: Initial 2 year existing flow has been calculated using 2.78Ai where A is the existing impermeable area and i is 50mm/hr. A detailed assessment of the site for the full range of rainfall events will need to be undertaken when the drainage layout has been determined.

As the existing slightly exceeds the proposed, the run-off from the site will not be increased and the development will not increase the risk of flooding elsewhere. It is proposed, however, that attenuation is included in the surface water system to achieve the aims of the Level 2 SFRA as detailed above. Any attenuation will be designed to provide no flooding in the 30year event and provide no flooding of property in the 100year event; an allowance for future climate change of 30% should be included in the design of the attenuation. A quick storage estimate has been undertaken on the basis of a permitted discharge of 136.5l/s for the 30 year and 100 year event (including 30% allowance for climate change); the results are included in Appendix J for the 100 year event plus climate change. The estimate predicts a storage volume of 144-308m^3 for the 30 year event and 361-674m^3 for the 100 year event. The 30 year volume will need to be stored below ground but the 100 year volume may be stored above ground on highways, parking areas etc.

A detailed assessment of the existing and proposed run-off will need to be undertaken during the final design to ensure the 50% reduction is achieved.

Previous experience in the vicinity of the site suggests the ground conditions will not be suitable for infiltration techniques and this will therefore rule out the majority of proposed SUDS techniques.

5.0 Conclusions

- The site is located within Flood Zone 1 with a low probability of flooding.
- The site is at a low risk of flooding from other sources.
- Although the existing impermeable area is greater than the proposed the Level 2 SFRA requires a 50% reduction in flows for development on Brownfield sites as the development is located in the Conurbation Core CDA. Attenuation will be required within the surface water drainage system to achieve this, the design of which should ensure there is no flooding in the 30year event and no flooding to property in the 100year event with a 30% allowance for future climate change.
- Experience in the area suggests the site will not be suitable for the use of infiltration SUDS techniques.
- At the present time, the drainage layout has been detailed to suit the requirements of Sewers for Adoption 6th Edition.
- Foul drainage will connect to the existing public sewers.

6.0 Recommendations

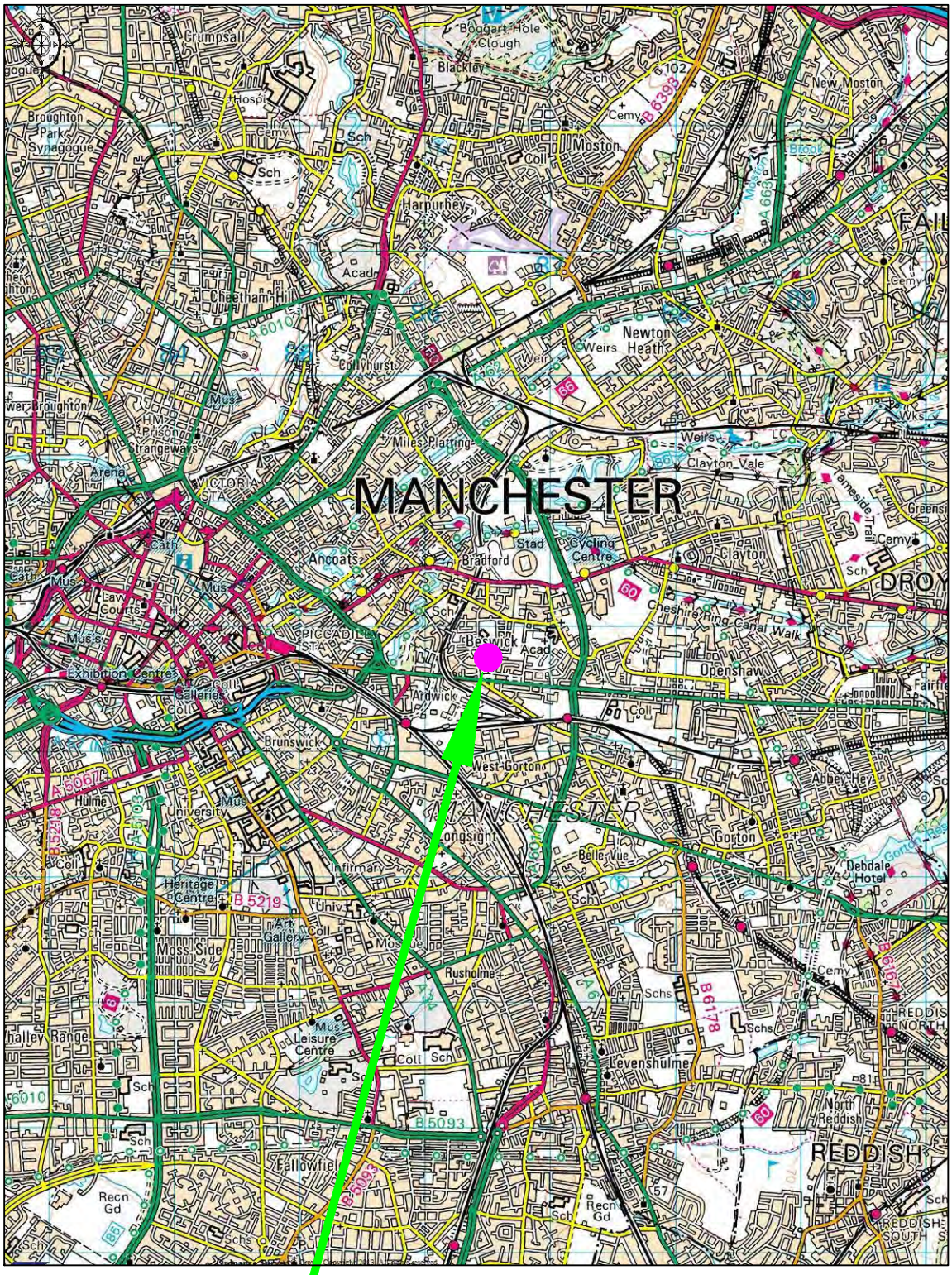
- Discussions should take place with United Utilities with regard to connecting the development to the existing foul and surface water sewers to ensure the discharge rates and connection points are acceptable.
- A detailed investigation into the existing sewers should be undertaken to determine those sewers that can be abandoned.
- During the detailed design of the surface water drainage a detailed assessment of the existing and proposed run-off will need to be undertaken to ensure the 50% reduction in surface water flows is achieved; an allowance of 30% should be made in the design of attenuation measures for future climate change.

- The external levels shall be designed to ensure overland flood routes exist through the development for use in exceptional circumstances.

- The finished floor levels of properties should be placed a minimum of 300mm above the adjacent road level to protect the properties against overland flows.

APPENDIX A

Site Location Plan



Site Location

North Point

Project
Beswick
Phase 3

Client
The Alan Johnston Partnership

Title
Site Location Plan

IronsideFarrar
Environmental Consultants
Environmental Planners
Civil Engineers
Landscape Architects
Graphic Design
3 Wesley Court MANCHESTER M3 3HJ
Tel. 0161 703 6331 Fax. 0161 703 6370
manchester@ironsidefarrar.com
EDINBURGH BELLSHILL

Original Size
A4

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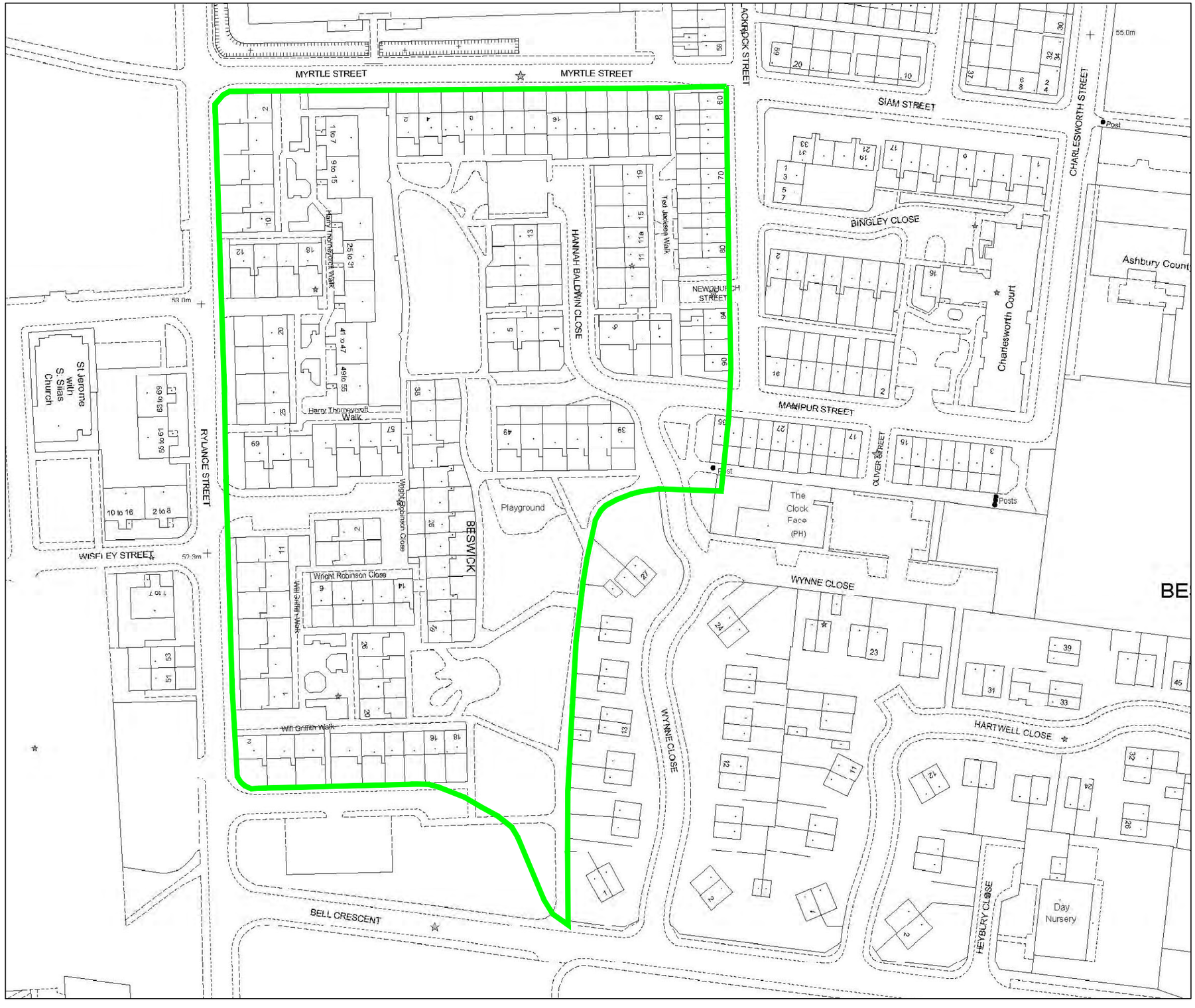
Drawing No.
30 008/App A
Revision

APPENDIX B

Existing Site Plan



KEY

Site Boundary

North Point

Quality Ass.

Project
Beswick Phase 3

Client
The Alan Johnston Partnership

Title
Existing Site Plan

Original Size
A3

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Environmental/Planners
Civil Engineers
Landscape Architects
Graphic Design
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Tel. 0161 705 6801 Fax. 0161 705 6279
manchester@ironsidefarrar.com
EDINBURGH BELLSHILL

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APPENDIX C

Aerial & Site Photographs



KEY

Site Boundary

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Project: Beswick Phase 3

Client: The Alan Johnston Partnership

Title: Aerial Photograph

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Graphic Design
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Tel. 0161 705 6501 Fax. 0161 705 6279
manchester@ironsidefarrar.com
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View South to Bell Crescent.



Southern Boundary of Site.



View North West to Rylance Street.



View North along Rylance Street.



General view East across the Site.



View South from Myrtle Street.



View East along Myrtle Street.



View South from Myrtle Street.



Blackrock Street viewed to the South.



View West from Manipur Street.



Site to the North from Manipur Street/Blackrock Street.



Wynne Close to the South.

APPENDIX D

Topographical Survey



North Point

Quality Ass.

Original Size
A1

Project
Beswick
Phase 3

Client
The Alan Johnston Partnership

Title
Topographical Survey

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Oct 13

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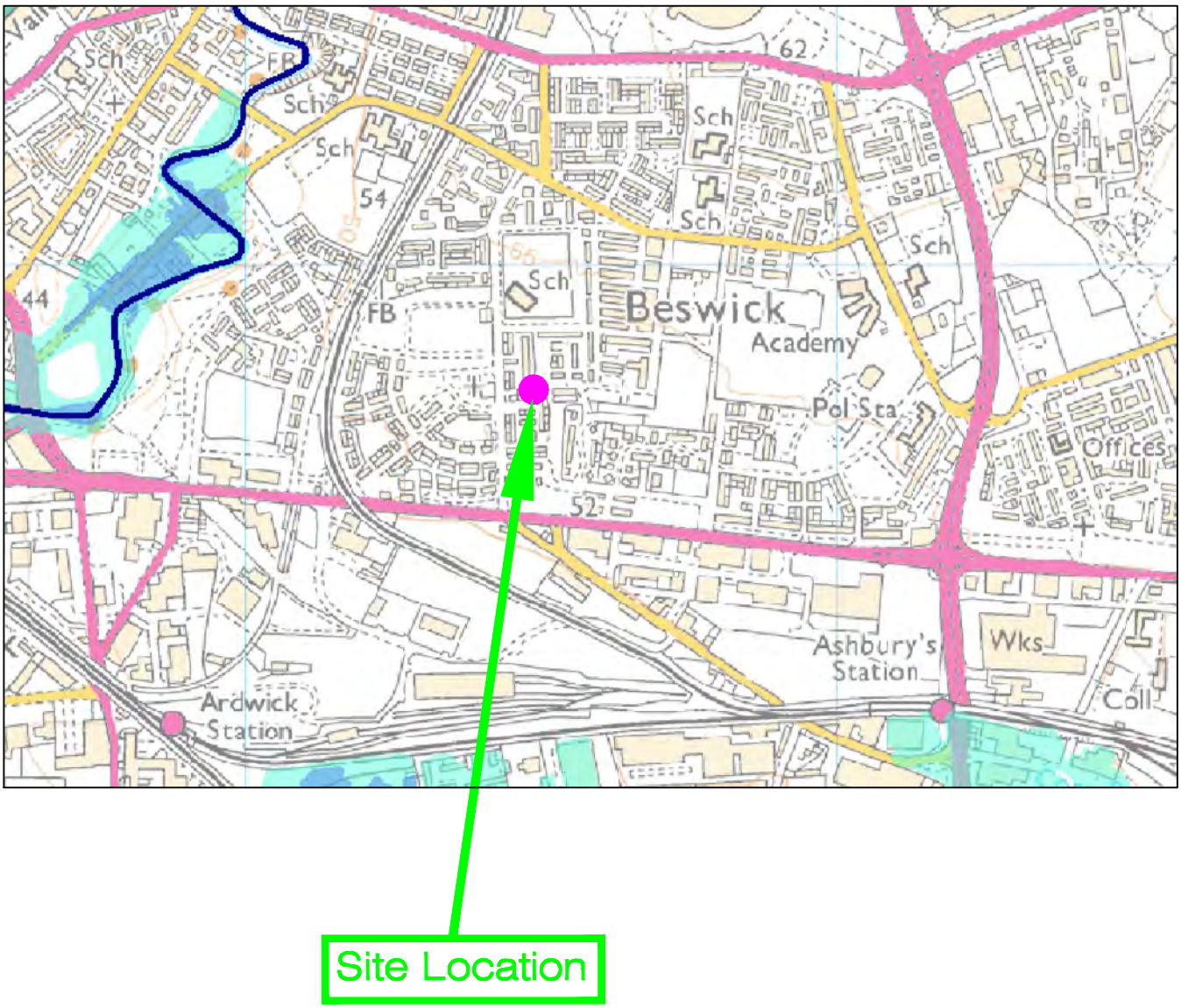
Civil Engineers
Landscape Architects
Graphic Design
3 Worsley Court MANCHESTER M23 3NJ
Tel. 0161 703 8801 Fax. 0161 703 8279
manchester@ironsidefarrar.com
EDINBURGH BELLSHILL

Drawing No.
30008/App D

Revision

APPENDIX E

Environment Agency
Flood Risk Map
&
Consultation with
Manchester City Council



North Point	Project: Beswick Phase 3	IronsideFarrar Environmental Consultants
Quality Ass.	Client: The Alan Johnston Partnership	Environmental Planners, Civil Engineers, Landscape Architects, Graphic Design
	Title: Environment Agency Flood Risk Map	3 Wesley Court MANCHESTER M25 2NJ Tel. 0161 703 8881 Fax. 0161 703 8879 manchester@ironsidefarrar.com EDINBURGH BELLSHILL
Original Size: A4	Copyright Acknowledgement: ©Crown Copyright. All rights reserved. Licence No. AL100017692. Drawn: NB Checked by: SRG Date: Aug 13 Scale: NTS	Drawing No.: 30 008/App E Revision:

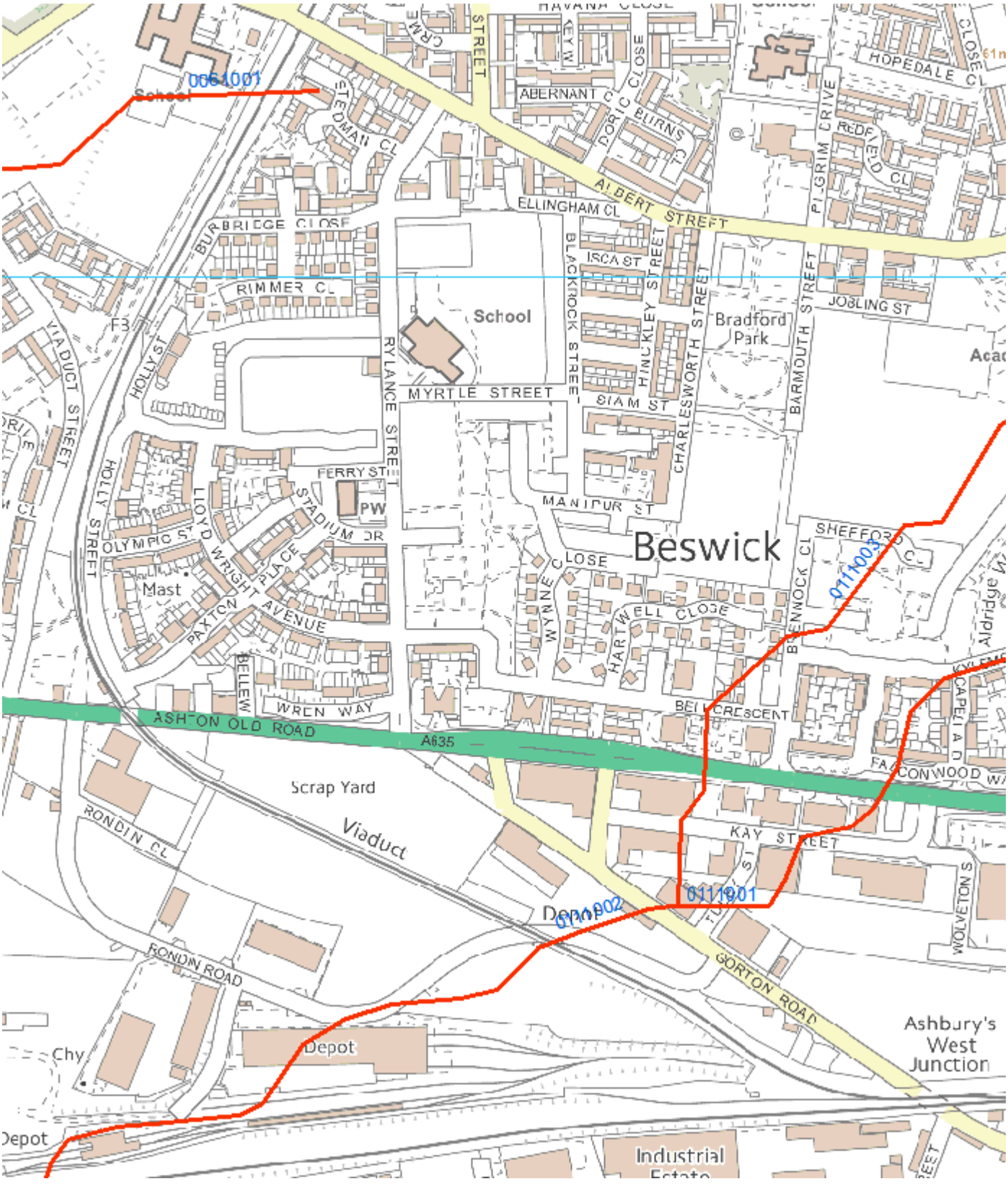
Simon Gough

From: z.todorovic@manchester.gov.uk
Sent: 24 September 2013 10:40
To: Simon Gough
Cc: e.ainsworth@manchester.gov.uk
Subject: Re: FW: Beswick Phase 3(30008)
Attachments: 940-SK003.1A OPT 3 Site Layout-email.pdf; Marked Up Sewer Records.pdf

Simon

Thank you for the email.

The site is in close proximity to a culverted tributary of the River Medlock to the North West and the culverted Black Brook to the South East of the site. Both of these watercourses are classed as Ordinary Watercourses. The exact routes of the watercourses are unknown due to their culverted nature so the layout plan should be regarded as indicative only.



There is no record of flooding of the site or the highways bounding the site from any source of flooding.

The area is within a known area susceptible to surface water flooding - see the Manchester City Council SFRA for further details.

With regards to drainage, you should follow the Building Regulation (Section H) strategy and indentify if the underlying soil is suitable for infiltration in first instance.

If no infiltration is feasible, the area is situated within the Conurbation Core Critical Drainage Area and in accordance

with the Manchester City Council SFRA a 50% reduction in surface water runoff should be provided through SUDS as part of any brownfield development. However, if you propose to discharge to the public sewer please note that United Utilities may have further restrictions in flow allowances based on the capacity of the sewers in the area.

Any works associated with an ordinary watercourse require a Flood Defence Consent from Manchester City Council; this includes building over it and/or within the vicinity of the watercourse as well as discharge of surface water into it.

If you need further clarification, please let us know.

Kind regards

Zorica

Zorica Todorovic. Dipl.-Ing., MSc (DIC), PhD, C.WEM, CEnv., CEng., MCIWEM
Engineer (Flood Risk Management)

Capital Programmes and Property
Growth and Neighbourhoods Directorate
Manchester City Council

Postal address:

PO Box 532, Town Hall, Manchester, M60 2LA

Office Location:

Level 5, Heron House, 47 Lloyd Street, Manchester, M2 5LE

Tel: 0161 219 6295 | Internal Tel: 800 6295 | Fax: 0161 274 7103
Email: z.todorovic@manchester.gov.uk | Web: http://www.manchester.gov.uk/

Simon Gough <simon.gough@ironsidefarrar.com>

21/09/2013 13:08

To "z.todorovic@manchester.gov.uk" <z.todorovic@manchester.gov.uk>, "e.ainsworth@manchester.gov.uk" <e.ainsworth@manchester.gov.uk>

cc

Subject FW: Beswick Phase 3(30008)

I note that I do not appear to have received any response to my original enquiry for the above.
I would be grateful if you could confirm whether you hold any records and when the information will be available.

Regards

Simon Gough | Director | Ironside Farrar | 3 Worsley Court **|** Worsley **| Manchester |**M28 3NJ **|**
Tel: 0161 703 8801 | Fax: 0161 703 8279 | Web:ironsidefarrar.com

---

From: Simon Gough
Sent: 07 August 2013 17:13
To: z.todorovic@manchester.gov.uk; e.ainsworth@manchester.gov.uk
Subject: Beswick Phase 3(30008)

Zorica/Esther, we are currently undertaking a Flood Risk Assessment and producing a Drainage Strategy for a further phase of the redevelopment of Beswick.

The site is bounded by Rylance Road, Myrtle Street and Blackrock Street as shown on the attached copy of the sewer records.

I would be grateful if you could confirm:

- Have you a record of flooding incidents in the vicinity of the site with any actual incidents directly affecting the site?
- Have you got a record of ordinary watercourses in the vicinity of the site?
- Have you got a record of flooding from other sources ie Groundwater, surface run-off etc?
- Are there any special requirements for the drainage of new development in this area?

An extract of sewer records, together with a development layout is attached for reference.

Your earliest attention to this matter would be most appreciated.

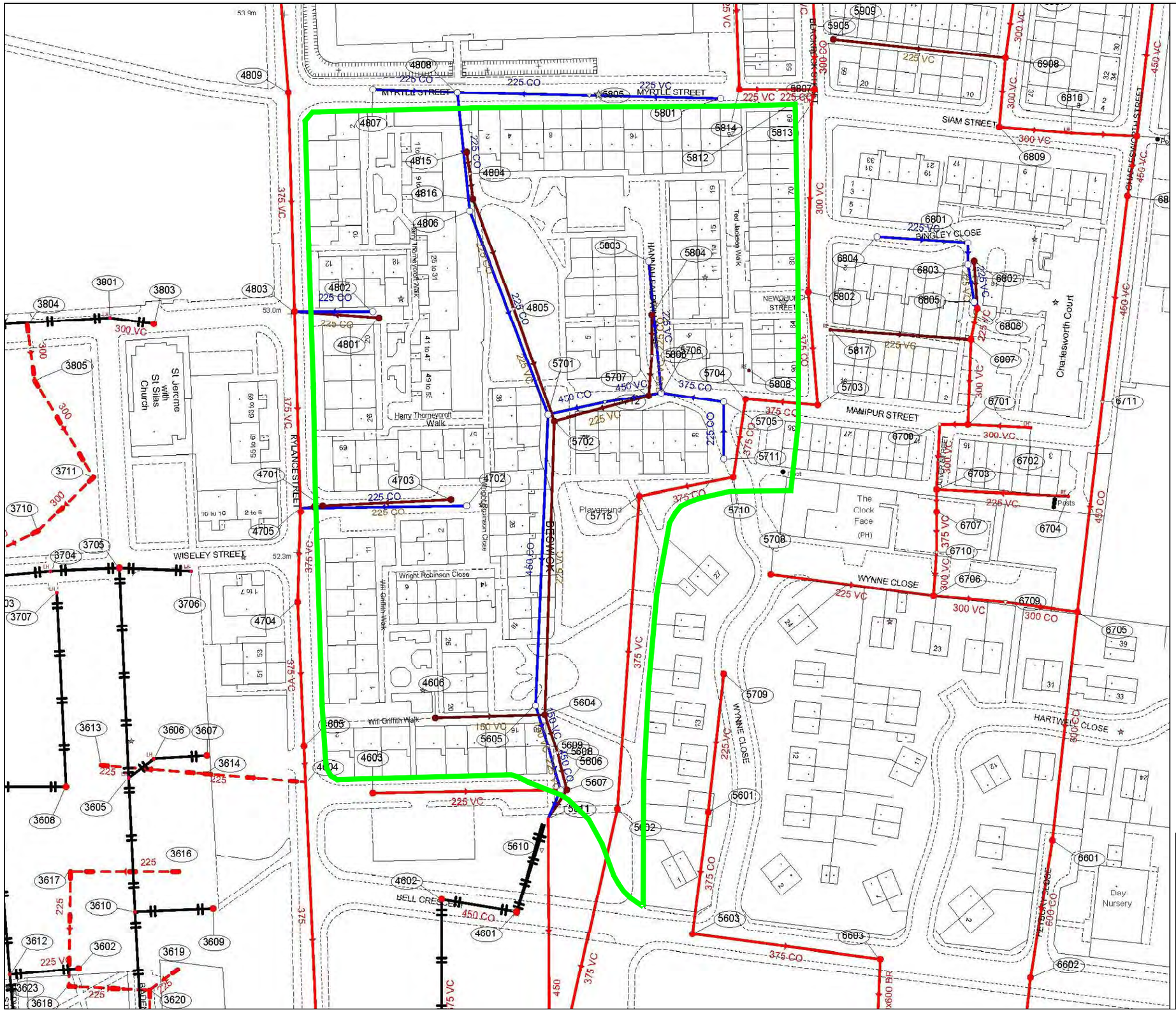
Please contact me if you require any further information to complete the consultation.

Regards

Simon Gough | Director | Ironside Farrar | 3 Worsley Court **|** Worsley **| Manchester |**M28 3NJ **|**
Tel: 0161 703 8801 | Fax: 0161 703 8279 | Web:ironsidefarrar.com

APPENDIX F

Existing Sewer Records



North Point	Project: Beswick Phase 3	IronsideFarrar Environmental/Consultants
Quality Ass.	Client: The Alan Johnston Partnership	Environmental/Planners Civil/Highways Landscape/Architects Graphic/Design
	Title: Existing Sewer Records	3 Worsley Court MANCHESTER M26 3NJ Tel. 0161 708 8801 Fax. 0161 708 8279 manchester@ironsidefarrar.com
Original Size: A3	Copyright Acknowledgement: ©Crown Copyright. All rights reserved. Licence No. AL100017666.	Drawn: NB; Checked By: SRG; Date: Aug 13; Scale: 1:1250
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		Drawing No.: 30 008/App F; Revision:

APPENDIX G

Consultation with United Utilities

Simon Gough

From: Simon Gough
Sent: 07 August 2013 17:51
To: 'Wastewaterdeveloperservices@uuplc.co.uk'
Cc: O'Brien, Neil
Subject: FW: Beswick Phase 3(30008)

Neil, we are currently undertaking a Flood Risk Assessment and producing a Drainage Strategy for a further phase of the redevelopment of Beswick.

The site is bounded by Rylance Road, Myrtle Street and Blackrock Street as shown on the attached copy of the sewer records.

I would be grateful if you could confirm:

- Has the actual site itself been the subject of flooding from the sewerage system?
- Have flooding incidents from the sewerage system affected the site?
- The intention will be to connect the proposed foul and surface water drainage to the existing combined sewers crossing the site. Surface water will be discharged at 50% of the existing rate. The ground conditions are believed not suitable for infiltration and there are no watercourses nearby.
- Can you confirm the point of connection and discharge rates for discharge to the sewer?

An extract of sewer records is attached for reference.

Your earliest attention to this matter would be most appreciated.

Please contact me if you require any further information to complete the consultation.

Regards

Simon Gough | Director | Ironside Farrar | 3 Worsley Court **|** Worsley **| Manchester |**M28 3NJ **|**
Tel: 0161 703 8801 | Fax: 0161 703 8279 | Web:ironsidefarrar.com



Marked Up Sewer Records.pdf

APPENDIX H

Proposed Development



PRELIMINARY

North Point

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Original Size
A1

Project
Beswick
Phase 3

Client
The Alan Johnston Partnership

Title
Proposed Development

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Civil Engineers
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Graphic Design
3 Worsley Court MANCHESTER M28 3NJ
Tel. 0161 703 8801 Fax. 0161 703 8279
manchester@ironsidefarrar.com
EDINBURGH BELLSHILL

Drawing No. 30008/App H

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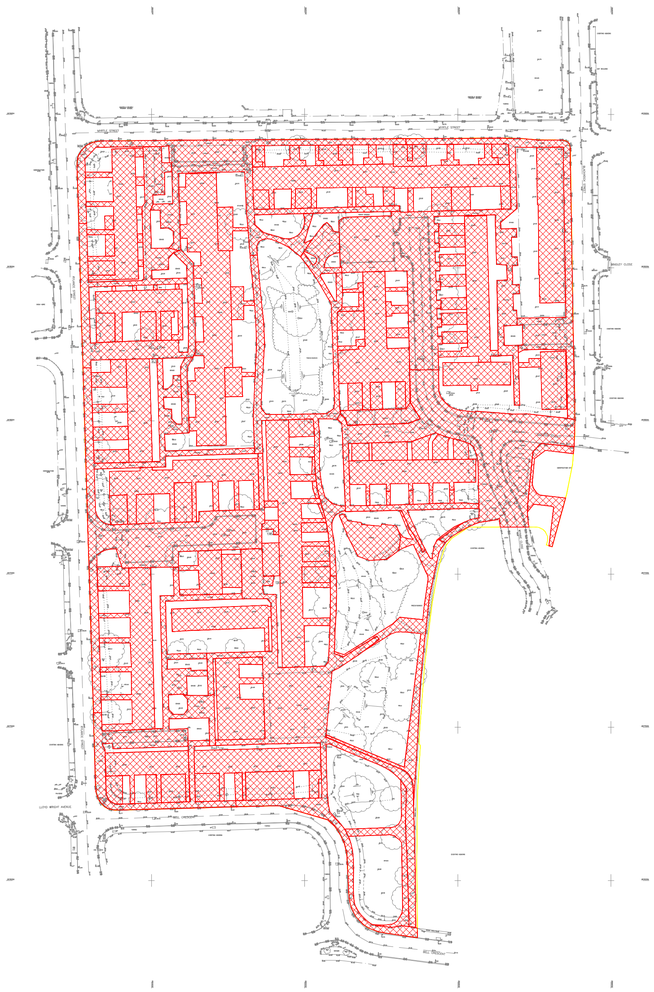
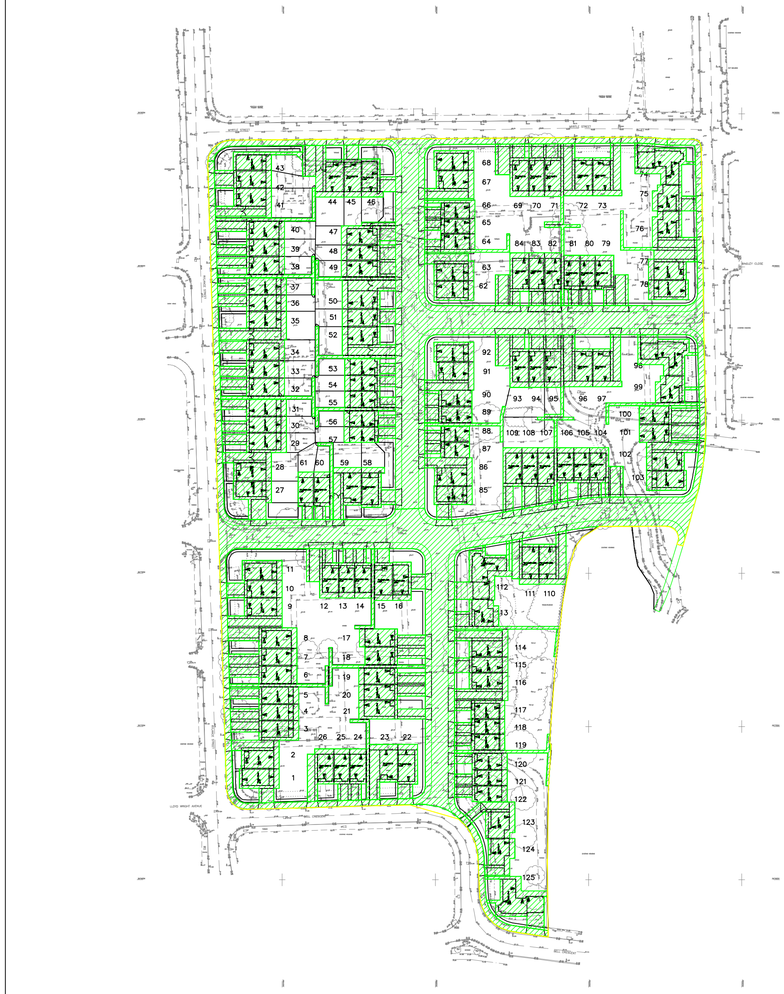
APPENDIX I

Existing & Proposed Impermeable Areas



Existing Impermeable
Area = 1.964ha



Proposed Impermeable
Area = 1.956ha

North Point

Quality Ass.

Original Size
A1

Project
Beswick
Phase 3

Client
The Alan Johnston
Partnership

Title
Existing & Proposed
Impermeable Areas

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Environmental Planners
CivilEngineers
LandscapeArchitects
GraphicDesign
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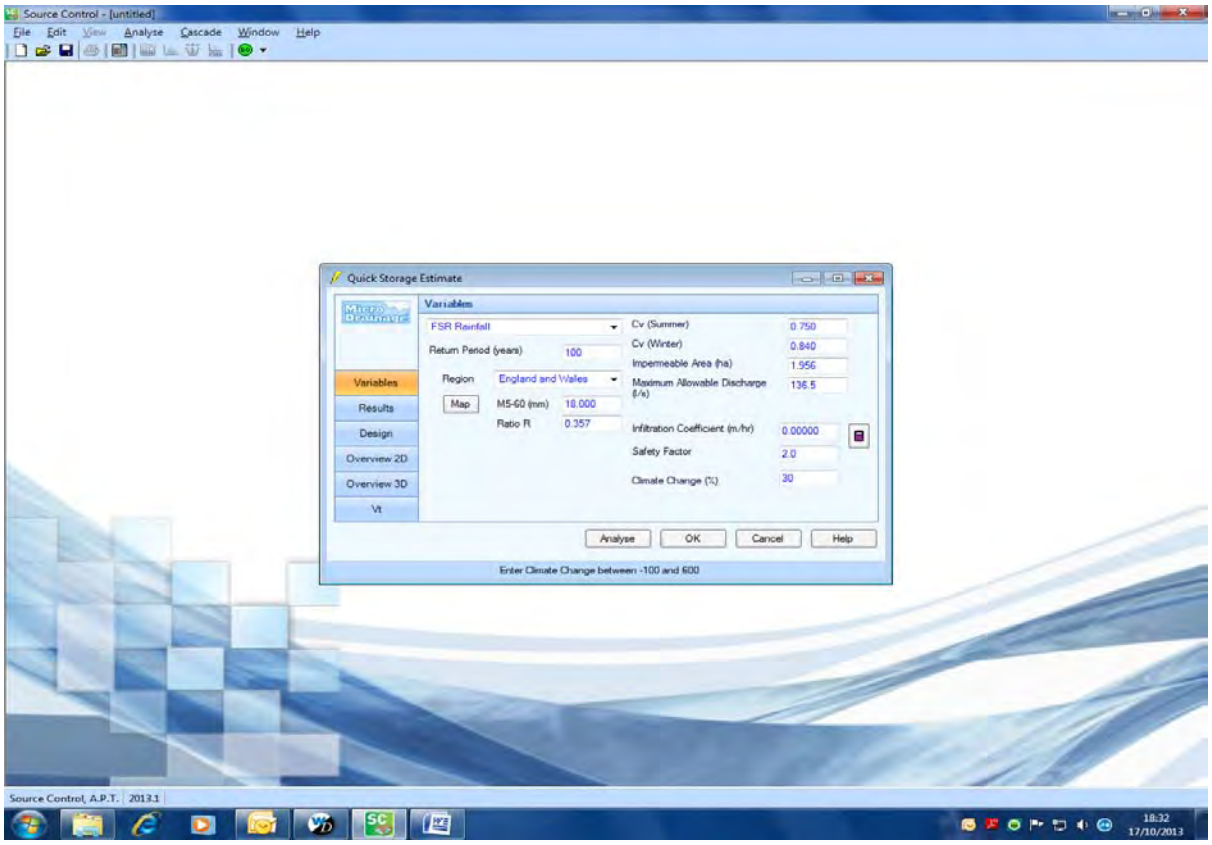
Tel. 0161 703 8501 Fax. 0161 703 8279
manchester@ironsidefarrar.com
EDINBURGH BELLSHILL

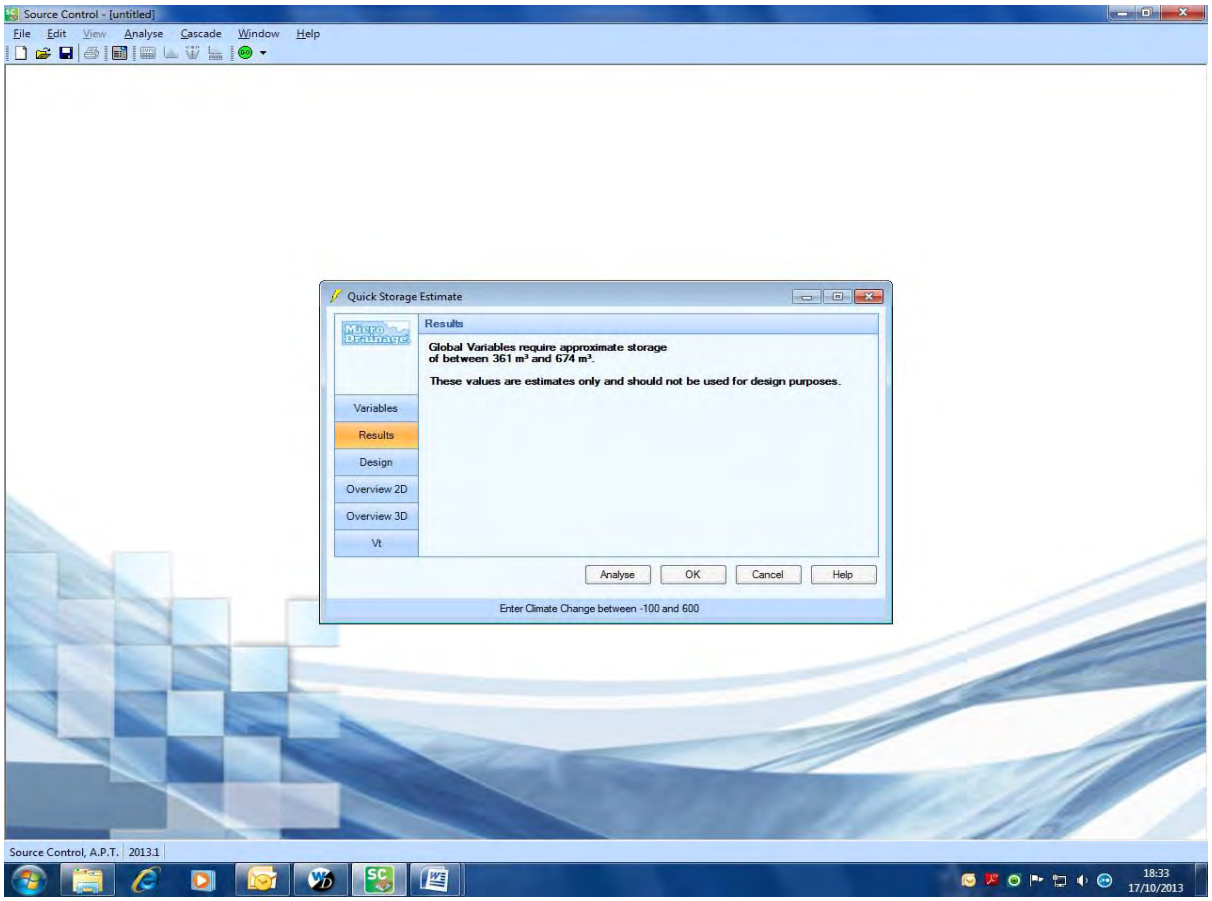
Drawing No. 30 008/App I

Revision

APPENDIX J

Quick Storage Estimate


Source Control - [untitled]
File Edit View Analyse Cascade Window Help
Quick Storage Estimate
Micro Drainage
Variables
Results
Design
Overview 2D
Overview 3D
Vt
Variables
FSR Rainfall
Return Period (years) 100
Region England and Wales
Map
M5-60 (mm) 18.000
Ratio R 0.357
Cv (Summer) 0.750
Cv (Winter) 0.840
Impermeable Area (ha) 1.956
Maximum Allowable Discharge (l/s) 136.5
Infiltration Coefficient (m/hr) 0.00000
Safety Factor 2.0
Climate Change (%) 30
Analyse
OK
Cancel
Help
Enter Climate Change between -100 and 600
Source Control, A.P.T. 2013.1
18:32
17/10/2013


Source Control - [untitled]
File Edit View Analyse Cascade Window Help
Quick Storage Estimate
Micro Drainage
Results
Global Variables require approximate storage of between 361 m³ and 674 m³.
These values are estimates only and should not be used for design purposes.
Variables
Results
Design
Overview 2D
Overview 3D
Vt
Analyse
OK
Cancel
Help
Enter Climate Change between -100 and 600
Source Control, A.P.T. 2013.1
18:33
17/10/2013