



civils ltd - consulting engineers



FLOOD RISK ASSESSMENT

PROPOSED REDEVELOPMENT AT RUSTINGTON RETAIL PARK, ANGMERING

CLIENT

Store Property Investments Ltd
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Chichester
West Sussex
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Ref: 4509/2.3
Date: June 2012

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Report by: Steve Lamprell BEng (Hons)

Issue	Date	Compiled	Checked
First Issue	27.06.2012	SDL	MR
Rev A	19.07.2012	SDL	MR

1.0 INTRODUCTION

- 1.1 **gta** civils Ltd were appointed by Store Property Investments Ltd to carry out a Flood Risk Assessment with respect to proposals for alterations to the car park at Rustington Retail Park.
- 1.2 The Flood risk assessment has been written in accordance with the National Planning Policy Framework (NPPF) and the associated guidance.
- 1.3 The existing site is a retail park consisting of commercial units and a car park. The layout of the existing development is shown on drawing 4509/100 & 101.
- 1.4 The Planning Application is for alterations to the existing car park on the site as shown on the architects drawing in appendix B.

2.0 EXISTING SITE

- 2.1 The site is currently a retail park with associated car park as shown on the aerial photo in Appendix A.
- 2.2 The site ranges in level from 4.66 – 5.79m AOD as shown on the existing drainage drawing 4509/100 in Appendix D.
- 2.3 The Environment Agency flood map shows that the site is outside the 1% annual probability tidal floodplain (1 in 100 year storm). See indicative flood plain map within Appendix C.
- 2.4 The site is approximately 1.5km from the coast and therefore at low risk from tidal flooding.
- 2.5 The SFRA by Capita Symonds dated January 2010 has been consulted and also shows that the site is outside of a flood zone. The SFRA map F1-F Fluvial flood zones (extents) in appendix A of the SFRA shows the nearest higher risk flood zone approximately 600m away to the west, which matches the flood map on the EA website.
- 2.6 The SFRA also does not show any other risks of flooding from local surface water or sewers in the area. However, it does provide information relating to higher risks of ground water flooding in the general area of the site.
- 2.7 It should be noted that there is no recorded history of flooding on the site in the past.
- 2.8 The existing site comprises of some hard standing and landscaping as shown on drawing 4509/100. The total existing impermeable surfacing is 16,493 sq.m, which currently drains to gullies. It is assumed that all the gullies on the site currently connect directly to the existing 1050mm dia. culvert. However, the roof drainage discharges to soakaways with high level overflows to the 1050mm dia. culvert.
- 2.9 It has been established from existing records and subsequent site visit that the culvert discharges to a pond on the west side of Mill Lane.
- 2.10 The calculations of the existing surface water run-off from the site are shown in appendix E.
- 2.11 The EA website shows that the site is not within a Ground source protection zone.
- 2.12 The sewer records show that there are no foul or surface water sewers that run across the site, as seen in Appendix F.

3.0 PROPOSED SITE LAYOUT AND LEVELS

- 3.1 Please refer to drawing nos. 4509/100 & 101 in appendix D.
- 3.2 The proposed development utilises the existing 'Focus' building, although does not affect the structure. The planning proposal is to extend the existing car park to create a total of 324 parking spaces. This will be achieved by extending existing bays (shown hatched on drg no. 4509/102 & 103) and relocating islands.
- 3.3 The site ranges in level from 4.66 – 5.79m AOD as shown on the existing drainage drawings 4509/100 & 101 in Appendix D. The proposed redesigned car park surfacing will be designed to tie-into the existing levels on the site.

4.0 SITE DRAINAGE

- 4.1 The proposed site area in the confines of the proposed new boundary fence occupies an area of 1.91 hectares.
- 4.2 The existing site consists of mainly impermeable surfacing. The total existing impermeable area is 1.65 hectares.
- 4.3 The existing surface water drainage run-off on the site currently drains to an existing 1050mm diameter culvert which runs across the site, as shown on drawings 4509/100 & 101 in appendix D. It has been established from existing records and subsequent site visit that the culvert discharges to a pond on the west side of Mill Lane.
- 4.4 It is shown on drainage surveys that the existing hard standing drains by means of gullies to a system of surface water drains which discharge into the existing 1050mm diameter culvert crossing the site. The roof drainage, however, discharges to existing soakaways, each with a high level overflow into the existing 1050mm diameter culvert for peak storm events.
- 4.5 The existing rate of run-off from the site during a peak a 1 in 100 year storm would be 724 litres/sec (peak rainfall of 158mm/hr) as shown in the calculations in appendix E. This calculation does not take into account any infiltration during the peak storm event into the soakaways.
- 4.6 The proposed total impermeable area of the site is 17,038 sq.m. The additional impermeable area on the site is 545 sq.m.
- 4.7 New soakaways have been designed to accommodate the additional impermeable areas on the site, in the event of a 1 in 100 year storm plus 20% climate change. See microdrainage results in Appendix E for design of additional soakaways. The size and depth of these soakaways will need to be checked following a full soil investigation to confirm infiltration rates. The infiltration rate has been assumed to be 1×10^{-5} m/s. The proposals are shown on drawing 4509/102 & 103 in appendix D.
- 4.8 Permeable paving may be an alternative to ring soakaways on this site. However, it is likely that the top layer of sub-soil has poor infiltration characteristics and therefore has not been used on the surface water strategy drawing. A full soil report and infiltration tests to BRE 365 should be carried out on site tests on site at detailed design stage prove that soakaways will work, as designed. At this stage it may be possible to change the design to incorporate permeable paving to replace some, or all of the proposed new ring soakaways for the car park.
- 4.9 The foul water drainage should be unaffected by the proposals, since there are no planned alterations to the buildings on the site.
- 4.10 SUDS has been incorporated into the design by utilising proposed soakaways, designed to accommodate the flows from the additional car park drainage.

- 4.11 Therefore, there would be no increase in flooding risk to the site or to neighbouring properties.

5.0 SUMMARY/RECOMMENDATIONS

- 5.1 The Environment Agency flood map shows that the site is outside the 1% annual probability tidal floodplain (1 in 100 year storm). See indicative flood plain map within Appendix C.
- 5.2 Due to the increase in impermeable areas with the proposed development additional soakaways have been designed to accommodate the flows in the event of a 1 in 100 year storm plus 20% climate change. This is designed as a separate system, so that the area of surface water run-off to the existing sewer will not increase. Also, new drainage runs have been designed to divert the flows to avoid manholes/ soakaways under the proposed units where possible.
- 5.3 Therefore, with the provision of the additional soakaways there would be no increase in flooding risk on site, or to neighbouring properties.

- End of Report -

APPENDIX A

Site location plan & Aerial Photo



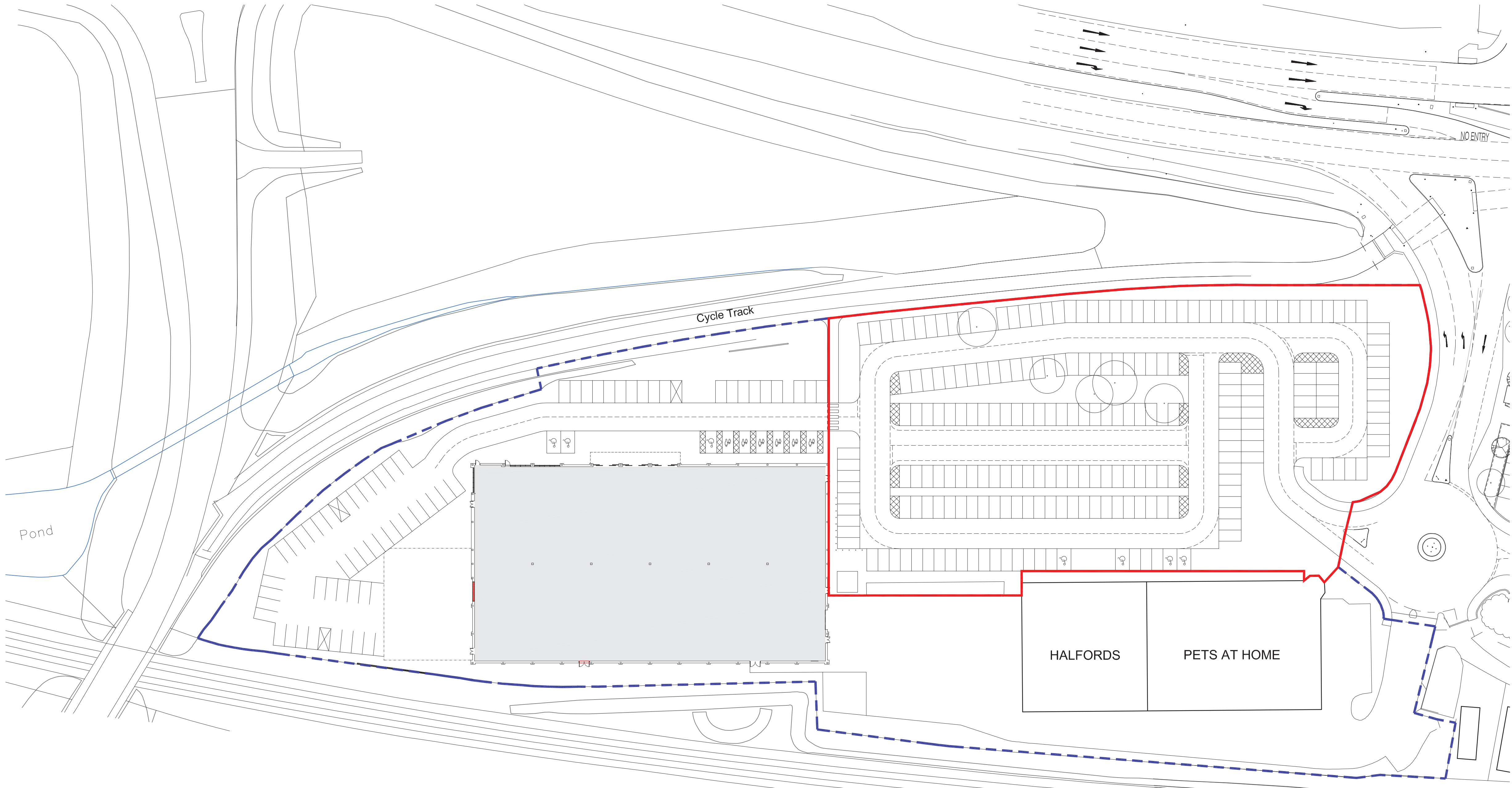
Site location plan



Aerial view of site

APPENDIX B

Development Proposals



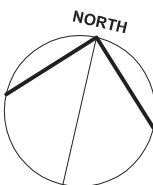
Temporary Store - Permanent Site Plan
Scale 1 : 500

GENERAL NOTES

This scheme is subject to Town Planning and all other necessary consents. Dimensions, areas and levels where given are only approximate and subject to site survey. All dimensions are to be checked on site. Do not scale other than for Planning purposes. This drawing is to be read in conjunction with all relevant consultants' and/or specialists' drawings/documents and any discrepancies or variations are to be notified to the architects before the affected work commences. All queries relating to design of foundations, floor slabs and any structural elements are to be referred to the structural engineering consultant for resolution. All feasibility studies are subject to full site survey. The workmanship of all relevant trades and building operations shall comply with the recommendations of British Standard (BS) 8000:1989 parts 1-15 inclusive.

All design and construction is to be in accordance with the Construction, Design and Management Regulations 2007.

PLANNING



SITE AREA			
Application Site Area	1.85 acres	0.75 hectares	
Total Site Area	4.82 acres	1.99 hectares	
CAR PARKING			
Standard Car Parking at 2.4 x 4.8m (GL)		288	
Disabled Parking Spaces		7	
Parent & Child Spaces		6	
Total Car Parking Spaces		298	

REV		DATE	BY
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CLIENT

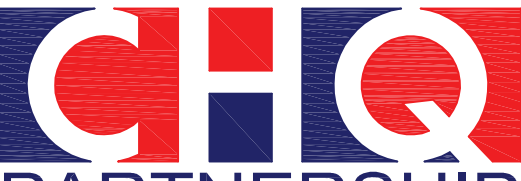
Sainsbury's

PROJECT

New Road
RUSTINGTON

DRAWING

Proposed Site Plan
Permanent Layout



CHQ
PARTNERSHIP
Architects • Building Surveyors

CHQ Partnership Ltd.
Tannery House, 23 High Street
Baldock, Hertfordshire SG7 6BE
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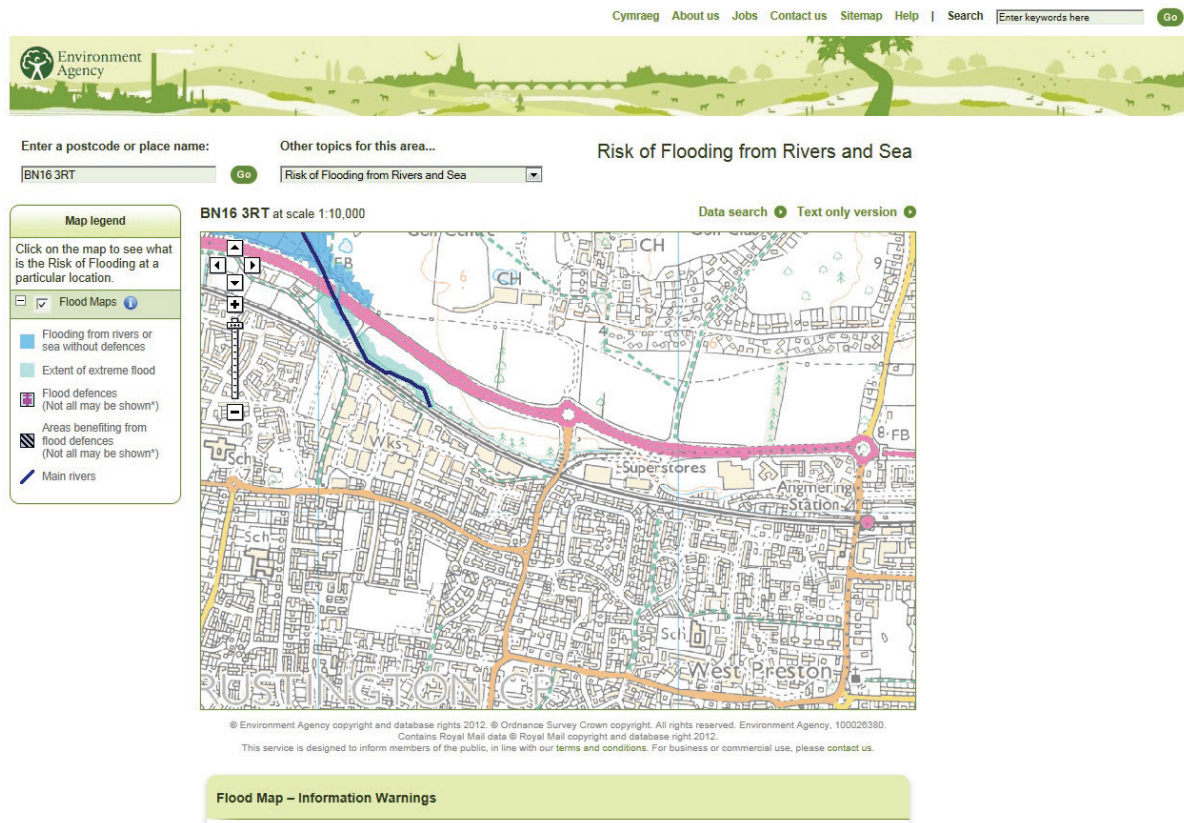
DATE	July 2012	DRAWN	MS
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CHQ.11.9647 - TS PL03

APPENDIX C

Environment Agency Flood Map



Environment Agency Flood Map

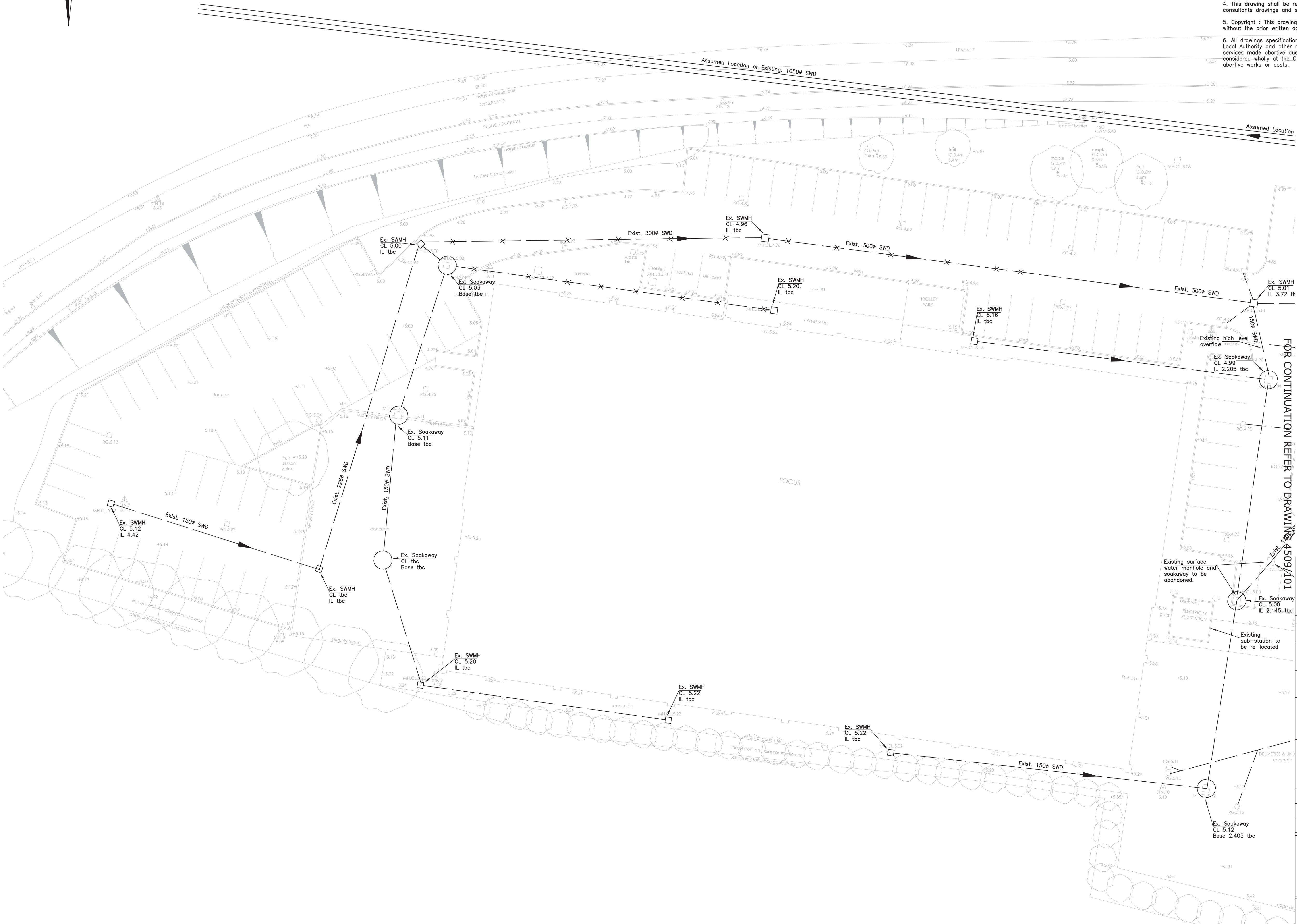
APPENDIX D

GTA Drawings



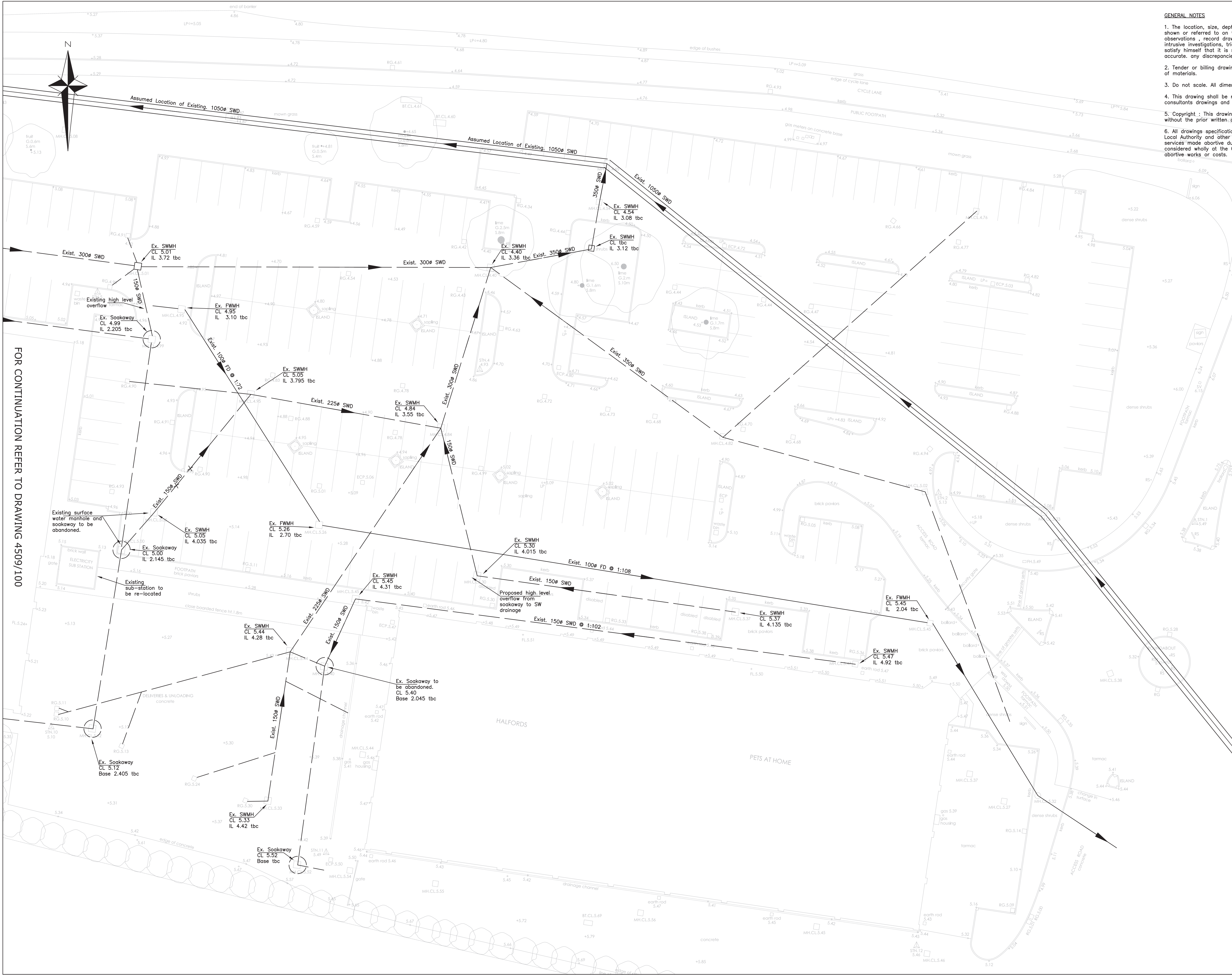
GENERAL NOTES

1. The location, size, depth and identification of existing services that may be shown or referred to on this drawing have been assessed from non intrusive observations , record drawings or the like. The contractor shall safely carry out intrusive investigations, trial holes or soundings prior to commencing work to satisfy himself that it is safe to proceed and that the assessments are accurate. any discrepancies shall be notified to gta prior to works commencing.
2. Tender or billing drawings shall not be used for construction or the ordering of materials.
3. Do not scale. All dimensions and levels to be site confirmed.
4. This drawing shall be read in conjunction with all relevant architects, consultants drawings and specifications, together with H&S plan requirements
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6. All drawings specifications and recommendations made by gta are subject to Local Authority and other relevant Statutory Authorities approval. Any works or services made abortive due to the client proceeding prior to these approvals is considered wholly at the Clients risk. gta hold no responsibility for resulting abortive works or costs.



FOR CONTINUATION REFER TO DRAWING 4509/101

Rev	Amendments	Date	Dsn	Chk
Status				
PRELIMINARY				
Client				
STORE PROPERTY INVESTMENTS				
Architect				
HGP				
Project				
RUSTINGTON RETAIL PARK				
Title				
EXISTING DRAINAGE LAYOUT SHEET 1 OF 2				
Date	JUNE 2012	Scale	1:200	
Base Layout Ref.		CAD File ref.		
Clients Ref.		Project Ref.		
		4509		
<div><div>gtacivils ltd</div><div>CONSULTING ENGINEERS gloucester house, 66a church walk, burgess Hill, west sussex, rh15 9as tel.01444 871444 fax.01444 871401 web: www.gtacivils.co.uk</div></div>				
Drawing Number			Rev.	
4509/100				

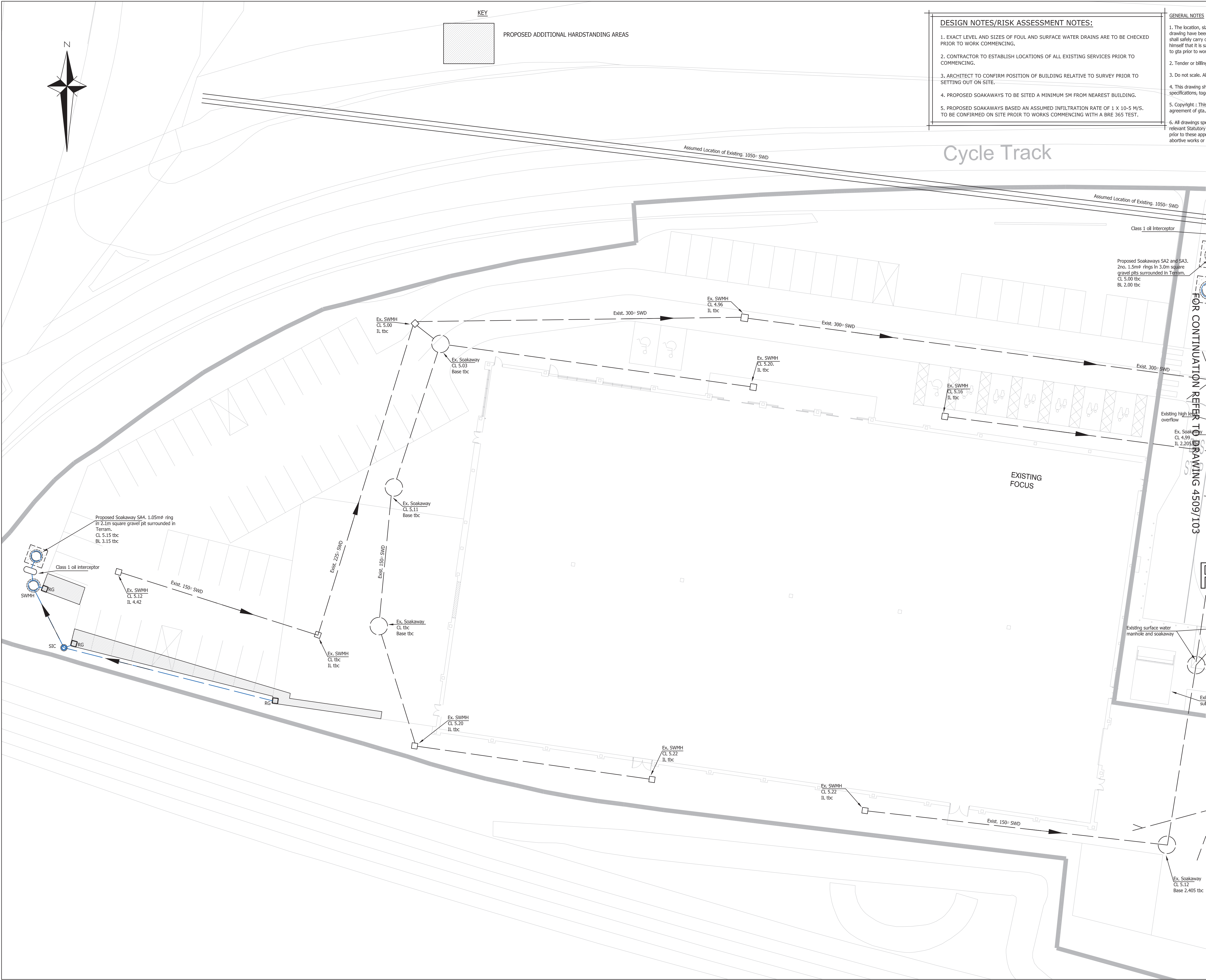


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FOR CONTINUATION REFER TO DRAWING 4509/100

Rev	Amendments	Date	Dsn	Chk
Status PRELIMINARY				
Client STORE PROPERTY INVESTMENTS				
Architect HGP				
Project RUSTINGTON RETAIL PARK				
Title EXISTING DRAINAGE LAYOUT SHEET 2 OF 2				
Date JUNE 2012		Scale 1:200		
Base Layout Ref.		CAD File ref.		
Clients Ref.		Project Ref. 4509		
<div><div></div><div><div>civils ltd</div><div>CONSULTING ENGINEERS</div><div>gloucester house, 66a church walk, burgess Hill, west sussex, rh15 9as tel.01444 871444 fax.01444 871401 web: www.gtacivils.co.uk</div></div></div>				
Drawing Number 4509/101			Rev.	



DESIGN NOTES/RISK ASSESSMENT NOTES:

1. EXACT LEVEL AND SIZES OF FOUL AND SURFACE WATER DRAINS ARE TO BE CHECKED PRIOR TO WORK COMMENCING.

2. CONTRACTOR TO ESTABLISH LOCATIONS OF ALL EXISTING SERVICES PRIOR TO COMMENCING.

3. ARCHITECT TO CONFIRM POSITION OF BUILDING RELATIVE TO SURVEY PRIOR TO SETTING OUT ON SITE.

4. PROPOSED SOAKAWAYS TO BE SITED A MINIMUM 5M FROM NEAREST BUILDING.

5. PROPOSED SOAKAWAYS BASED AN ASSUMED INFILTRATION RATE OF 1 X 10-5 M/S. TO BE CONFIRMED ON SITE PROIR TO WORKS COMMENCING WITH A BRE 365 TEST.

GENERAL NOTES

1. The location, size, depth and identification of existing services that may be shown or referred to on this drawing have been assessed from non intrusive observations , record drawings or the like. The contractor shall safely carry out intrusive investigations, trial holes or soundings prior to commencing work to satisfy himself that it is safe to proceed and that the assessments are accurate. any discrepancies shall be notified to gta prior to works commencing.

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Legend/Abbreviations

D307.0 DETAIL NUMBER - SEE DRAINAGE DETAIL SHEET

FD	FOUL DRAIN
SWD	SURFACE WATER DRAIN
MH	MANHOLE
IC	INSPECTION CHAMBER
CI	CAST IRON
VC	VITRIFIED CLAY
CONC	CONCRETE
PVC-U	POLYVINYL CHLORIDE - UNPLASTICISED
CPS	CAR PARK GULLY
DP	BELOW GROUND DRAIN POINT
SVP	100+ SOIL VENT PIPE DROP THROUGH SLAB TO BASEMENT
FFL	FINISHED FLOOR LEVEL
SSL	STRUCTURAL SLAB LEVEL
GL	GROUND LEVEL
CL	COVER LEVEL
IL	INVERT LEVEL
BD	BACKDROP
CBS	Concrete Bed & Surround
Class S	Granular Bed & Surround
Class B	Granular Bed
FIC	450mm dia. foul inspection chamber
SIC	450mm dia. surface water inspection chamber
FAC	300mm dia. foul access chamber
SIC	300mm dia. surface water access chamber

Legend/Abbreviations

FWMH Foul Manhole

SWMH Surface Water Manhole -

BELOW GROUND SURFACE WATER DRAIN

BELOW GROUND FOUL DRAIN

SVP SOIL VENT PIPE

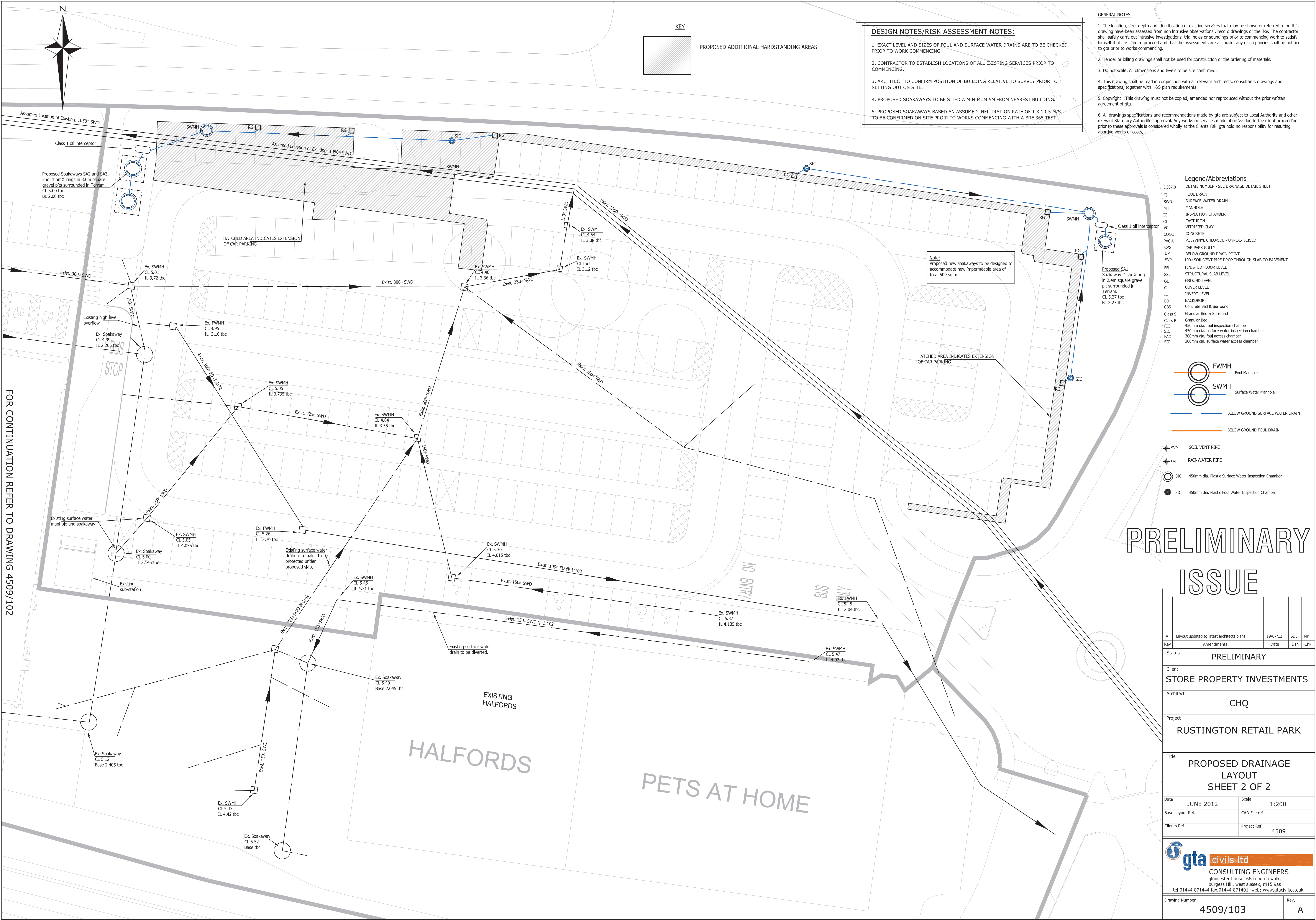
RWP RAINWATER PIPE

SIC 450mm dia. Plastic Surface Water Inspection Chamber

FIC 450mm dia. Plastic Foul Water Inspection Chamber

PRELIMINARY
ISSUE

A		Layout updated to latest architects plans		19/07/12		SDL	MR
Rev	Amendments			Date	Dsn	Chk	
Status							
PRELIMINARY							
Client							
STORE PROPERTY INVESTMENTS							
Architect							
CHQ							
Project							
RUSTINGTON RETAIL PARK							
Title							
PROPOSED DRAINAGE LAYOUT SHEET 1 OF 2							
Date		JUNE 2012		Scale		1:200	
Base Layout Ref.				CAD File ref.			
Clients Ref.				Project Ref.			
				4509			
 gta civils ltd							
CONSULTING ENGINEERS							
gloucester house, 66a church walk, burgess Hill, west sussex, rh15 9as tel.01444 871444 fax.01444 871401 web: www.gtacivils.co.uk							
Drawing Number						Rev.	
4509/102						A	



APPENDIX E

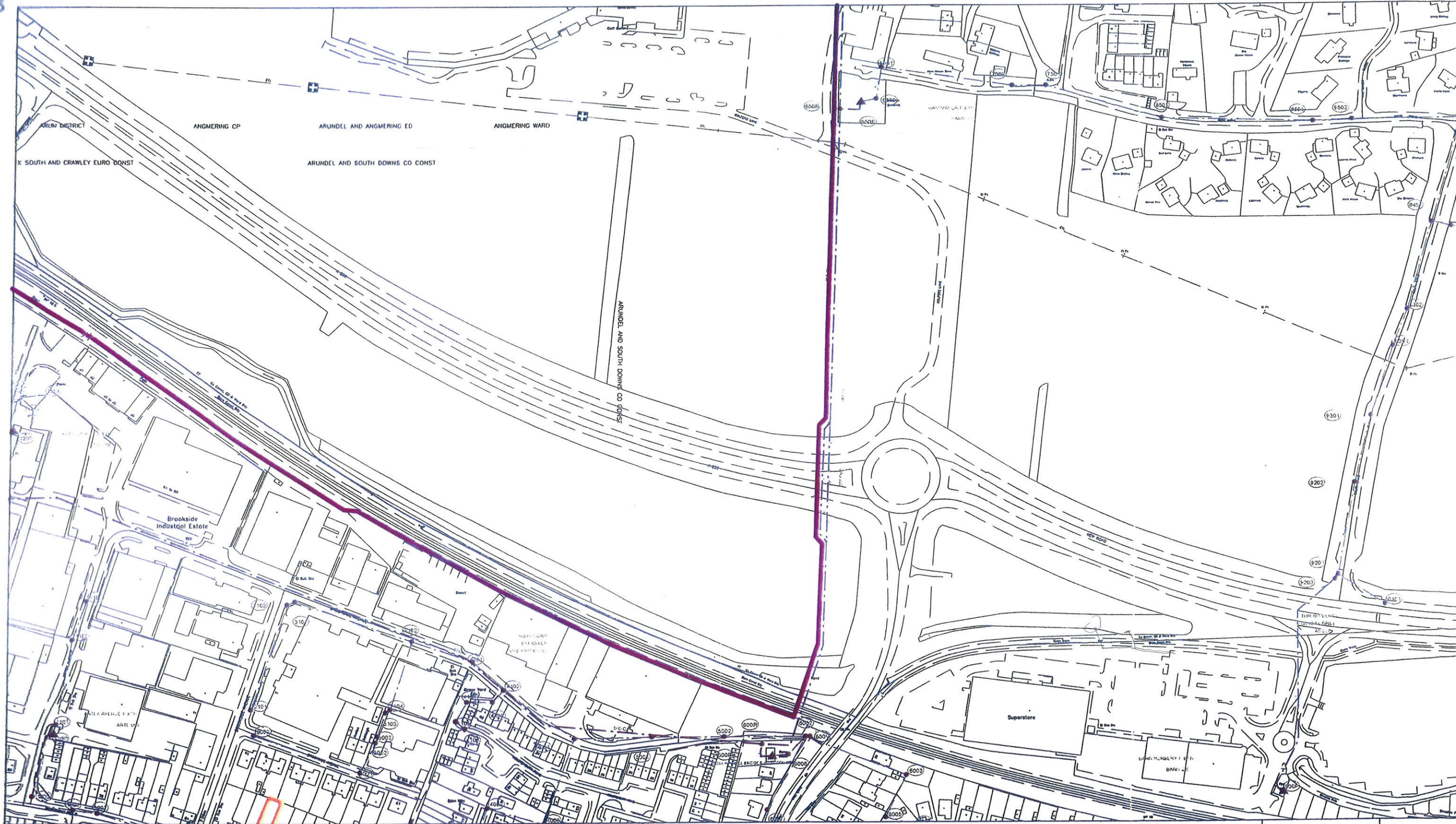
Calculations

APPENDIX F

Sewer records

SEWER RECORDS PAGE 1 OF 2

103595



103040

505117

O.S. REF.

TQ0503SE

Title: **ANGMERING**

Drawn by: **ottdev2**

Scale: **1:2500**

Date: **10-05-2006**

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site.

WARNING: FRC pipes are constructed of Bonded Asbestos Cement
WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement

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Southern Water



APPENDIX G

Site Photos





