



Proposed Timpson Concession Pod
Sainsbury's Store,
Shripney Road, Bognor Regis
Arun

Flood Risk Assessment &
Drainage Strategy

T. Asbridge

October 2014



REPORT CONTROL

Document: Flood Risk Assessment

Project: Timpson Concession Pod, Shripney Road

Client: Sainsbury's

Job Number: A089544-1

File Origin: N:\Projects\A089000 - A089500\A089544 - Sainsbury's Framework\A089544 - 01_Bognor Regis FRA\Correspondence\Reports

Document Checking:

Primary Author	T.Asbridge	Initialled:	TA
Contributor	L.Kasma	Initialled:	LK
Review By	D. Forward	Initialled:	DF

Issue	Date	Status	Checked for Issue
1	20/10/14	Issue One	LK



CONTENTS

1.0	Introduction	1
2.0	Development Description and Location	2
3.0	Definition of the Flood Hazard	3
4.0	Probability	5
5.0	Flood Risk Management Measures	6
6.0	Offsite Impacts	6
7.0	Drainage Strategy	7
8.0	Conclusion	8

Appendices

8.1	Appendix A: Location Plan
8.2	Appendix B: Existing & Proposed Site plan
8.3	Appendix C: EA's Indicative Flood Risk Map
8.4	Appendix D: SFRA Maps
8.5	Appendix E: Southern Water Asset Maps
8.6	Appendix F: Existing Drainage



1.0 INTRODUCTION

WYG Engineering Ltd has been engaged to carry out a Flood Risk Assessment (FRA) for a new Timpson's Concession Pod at an existing Sainsbury's Store in Shripney Road, Bognor Regis. The FRA is to be prepared in support of a planning application for the development.

This Flood Risk Assessment is prepared in accordance with the requirements of National Planning Policy Framework (NPPF) and accompanying technical guide. NPPF sets out the framework for planning decisions made by the local, regional and national government and the Environment Agency (EA). In order that planning authorities can make informed decisions on the development of sites in areas at risk of flood, NPPF requires the developer to carry out an assessment of flood risk. These requirements include the following:

- Assessment of the magnitude and severity of flood risk to the site
- Assess suitability of site and development through the use of the Exception Test (if required)
- Consider flood risk due to overtopping of existing flood defences
- Assess impact of proposed development on flood risk to adjacent developments
- Determine ability of existing and proposed drainage to accommodate development flows with respect to surface flooding
- Demonstrate that appropriate mitigation measures have been taken to prevent flooding
- Demonstrate that appropriate emergency situations have been considered e.g. overland flow paths, evacuation routes

This report addresses the requirements of NPPF and other issues which are deemed relevant to flood risk.



2.0 DEVELOPMENT DESCRIPTION AND LOCATION

2.1 Development and location

The development is a Timpson's retail concession pod, located outside an existing Sainsbury's Store in Bognor Regis. The existing store is located adjacent to the A29 (Shripney Road), on the north eastern fringes of Bognor Regis, as shown by the location plan in Appendix A. The site is bordered to the south by the Aldingbourne Rife and a development of business units, to the west by the A29 Shripney Road, to the north by the Southern Cross trading Estate and to the East by railway lines.

The proposal is for a single storey standalone retail concession space, approximately 14.5sq m, with a dry cleaning operation, shoe and watch repairs, key cutting and engraving services. The proposed pod is positioned on the north-east side of the store, adjacent to an existing trolley storage bay and bench, which will be relocated adjacent to the proposed unit. The concession will be accessed from outside of the store and comprise of customer service counter and waiting area with staff working area beyond. The existing and proposed site plans can be found in Appendix B.

2.2 Vulnerability Classification

The development is classed as Less Vulnerable, as it is retail, under Table 2 of the NPPF Technical Guidance. According to the EA's flood risk maps the site is located in Flood Zone 3a. The EA's flood risk maps are included in Appendix C. The proposed development is appropriate in areas of Flood Zone 3a under Table 3 of the NPPF Technical Guidance document.

Flood risk vulnerability classification		Essential infrastructure	Water Compatibility	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone	Zone 1	√	√	√	√	√
	Zone 2	√	√	Exception Test required	√	√
	Zone 3a	Exception Test required	√	X	Exception Test required	√
	Zone 3b	Exception Test required	√	X	X	X

Key: √ Development is appropriate
 X Development should not be permitted



3.0 DEFINITION OF THE FLOOD HAZARD

3.1 Sources of Flooding

The identified sources of potential flooding on the site are: fluvial, tidal, surface water, groundwater, infrastructure failure and sewers.

3.1.1 Flooding from Rivers

The new development is entirely situated within Flood Zone 3a (High risk). This zone is defined as land having a 1 in 100 or greater annual probability of flooding from rivers (>1%).

The Arun Strategic Flood Risk Assessment shows the site to have low risk of fluvial flooding. However, this is a broad scale assessment and the EA maps should be used in order to assess flood risk for the development. SFRA maps can be found in Appendix D.

The EA map for flood risk from rivers and sea that include the effect of flood defences shows that the site has a high chance of flooding from rivers and sea. This means that each year, the site has a chance of flooding of greater than 1 in 30 (3.3%).

This takes into account the effect of any flood defences that may be in this area. Flood defences reduce, but do not completely stop the chance of flooding as they can be overtopped or fail.

The Flood Risk Assessment that was prepared for the Sainsbury's Store in 2008 states that according to the EA, a level of 1.90m AOD can be applied in this area as the level of the 1 in 100 year fluvial flooding event, including for climate change.

3.1.2 Tidal Flooding

As mentioned above, the new development is within Flood Zone 3a. This is land having a 1 in 200 or greater annual probability of flooding from the sea (>0.5%).

The Arun Strategic Flood Risk Assessment does not show the site as being at risk from flooding from the sea on the actual flood risk map (Map A1-T taking into account defences), showing that the defences protect the site against a flood event of 1 in 200 years (0.5%). However, there is still a significant risk of flooding from the sea should these defences be overtopped or breached in an extreme event.



3.1.3 Flooding from Surface Water

The EA flood maps for the proposed development show this area has a chance of flooding of less than 1 in 1000 (0.1%) from surface water. there are no reported incidents of surface water flooding within or around the site.

The new development will not increase the impermeable area of the site, therefore, no additional surface water runoff will discharge into the existing surface water network.

3.1.4 Flooding from Groundwater

The site does not lie in a Groundwater Source Protection Zone according to the EA's maps. Map G1 of the Arun Strategic Flood Risk Assessment (Appendix D) shows that even though the site is not within a groundwater Emergence Zone, Groundwater Flood Risk in the area is classified as being high.

The Arun Strategic Flood Risk Assessment states that deep foundation, basements and underground infrastructure will be most at risk of groundwater flooding.

The new development is only a minor extension to an existing site. No incidents of groundwater flooding have been reported and appropriate mitigation measures have been incorporated to the design of the existing store.

3.1.5 Flooding from Existing Infrastructure Failure

Canals, Reservoirs, lakes and pumping stations can be considered for assessing existing infrastructure failure. Such infrastructure was not identified during the Arun Strategic Flood Risk Assessment.

3.1.6 Flooding from Sewers

There are both surface and foul water public sewers running parallel to the western edge of the site, under the A29 Shripney Road. The public sewers are the responsibility of Southern Water and are assumed to be well maintained. A copy of the Southern Water Asset maps can be seen in Appendix E.

There are a number of private surface and foul water sewers currently on site (see Appendix F for details). Since the site has been recently redeveloped, the existing infrastructure is assumed to be in good condition and well maintained. There are no historic incidents of



flooding from sewers in the vicinity of the site. The Arun SFRA map of historic flood events from various sources can be seen in Appendix D.

3.2 Existing Surface Water Drainage

There are a number of surface water sewers and ACO drains currently on site. All surface water passes through a Class 1 Bypass Interceptor before discharging from the site. The trolley shelters which are being replaced by the concession pod have no formal drainage arrangements.

There is an existing 375mm diameter pipe next to the proposed development that is used to drain surface water from the Store's Roof. The new development does not increase the impermeable area of the site and will not create additional flows into the existing surface water network.

4.0 PROBABILITY

4.1 Flood Zone

According to EA flood risk mapping the site currently falls within Flood Zone 3a (see Appendix C).

4.2 Existing Rates of run-off from the site

The new development is within an existing Sainsbury's Store. As the new concession pod will be built over an impermeable area, the surface water run-off will be the same pre and post-development and there will be no increase in flood risk on site or elsewhere.



5.0 FLOOD RISK MANAGEMENT MEASURES

5.1 Site flooding protection

Surface water runoff from the new concession pod will discharge into the existing surface water network currently on site. The concession pod is built on an impermeable area and will not create any addition flows into the existing system.

6.0 OFFSITE IMPACTS

6.1 Managing off-site flood risk

By ensuring that the existing run-off rate from the site is maintained, there will be no increase of flood risk at any other locations downstream. The project has no other effect on the flooding of the area, as it does not alter any watercourse or flow route in any way.

6.2 Remaining Risks

The flood-related risks that will remain after the development has been completed are as follows:

- Risk of tidal flooding.
- Risk from groundwater flooding.

6.3 Residual Risk Management

The Environment Agency and Arun District Council are responsible for the management and maintenance of existing sea defences.



7.0 DRAINAGE STRATEGY

7.1 Foul Drainage

There is no foul drainage requirement for the proposed Timpson pod.

7.2 Surface Water Drainage

Currently, runoff from the trolley shelters drains into the nearby ACO channels of the car park.

It is proposed to keep the drainage arrangements the same for the new Timpson concession pod and utilise the sites existing surface water drains and channels.



8.0 CONCLUSION

The site is in Flood Zone 3a and suitable for less vulnerable retail development according to NPPF table 3.

Surface water drainage arrangements will remain the same as present, with the drainage channel of the car park picking up the surface water of the new concession pod.

There are no foul connections in the concession pod.

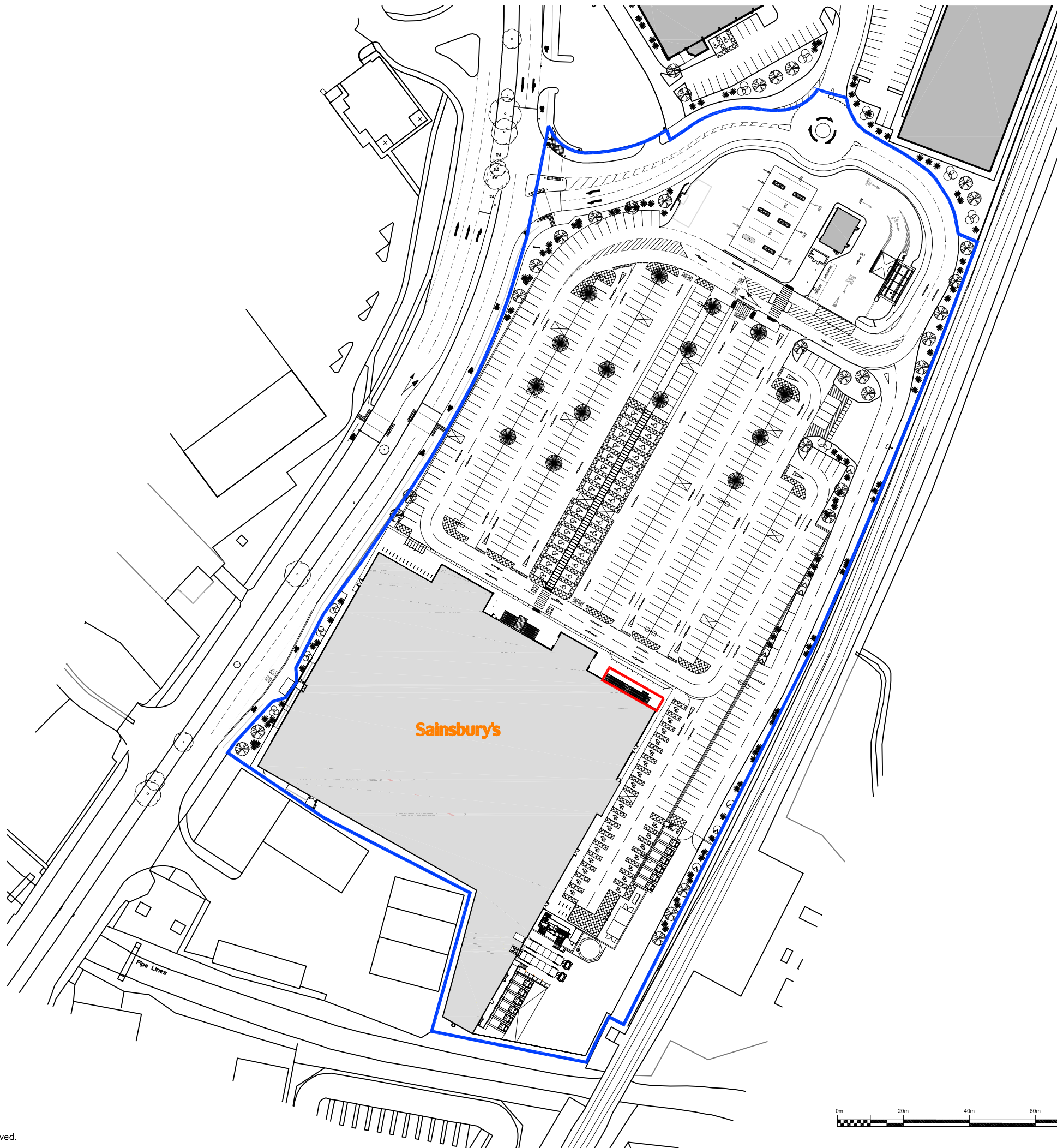
The development is not considered to be at significant risk of flooding or to increase flood risk to the site or surrounding area.



APPENDIX A

Location Plan

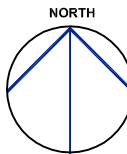




All feasibility studies are subject to full site survey. All dimensions are to be checked on site.

BOGNOR REGIS

PLANNING



- Area of proposed works
(proposed Timpson pod)
- Extent of Sainsbury's demise

REV	DATE	BY
CLIENT		

Sainsbury's

PROJECT

Shripney Road
BOGNOR REGIS
PO22 9FB

DRAWING

Site Location Plan

CHQ
PARTNERSHIP
Architects • Building Surveyors

CHQ Partnership Ltd.
Tannery House, 23 High Street
Baldock, Hertfordshire SG7 6BE
Telephone: (01462) 895110
Facsimile: (01462) 895099
Email: design@chq-architects.co.uk
www.chq-architects.co.uk



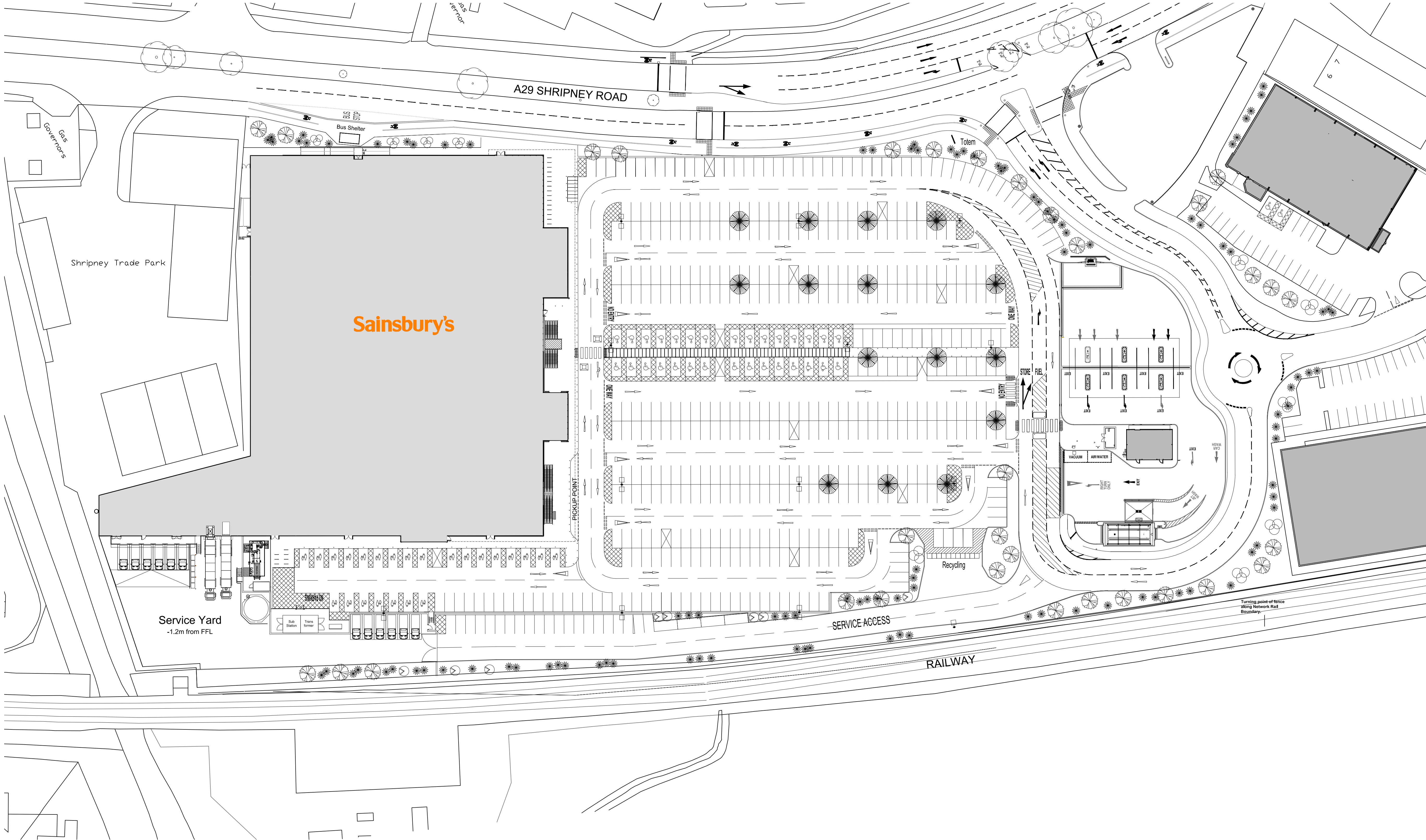
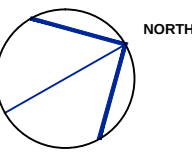
DATE	Sept. 2014	DRAWN	JW
SCALE	1 : 1250 @ A3	CHECKED	

CHQ.14.10938 - PL01



APPENDIX B

Existing & Proposed Site Plan



REV	DATE	BY
CLIENT		

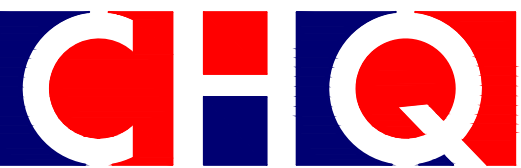
Sainsbury's

PROJECT

Shripney Road
BOGNOR REGIS
PO22 9FB

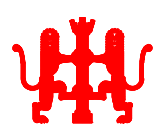
DRAWING

Existing Site Plan



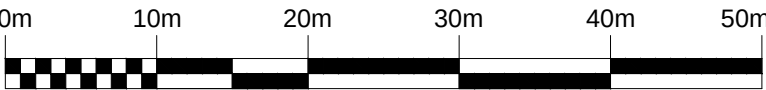
CHQ
PARTNERSHIP
Architects • Building Surveyors

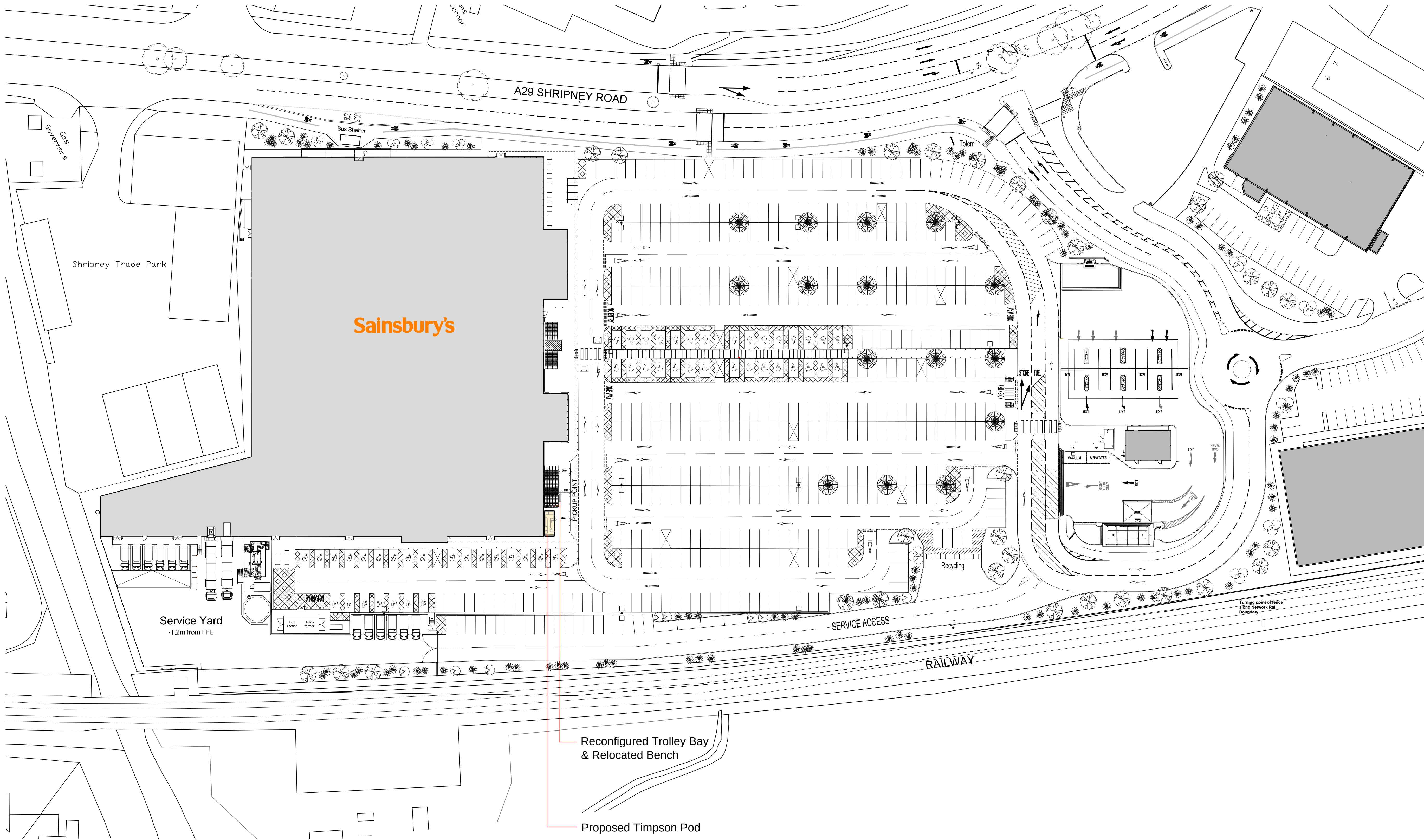
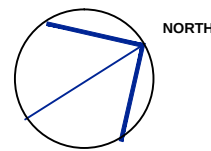
CHQ Partnership Ltd.
Tannery House, 23 High Street
Baldock, Hertfordshire SG7 6BE
Telephone: (01462) 895110
Facsimile: (01462) 895099
Email: design@chq-architects.co.uk
www.chq-architects.co.uk



DATE	Sept. 2014	DRAWN	JW
SCALE	1 : 500 @ A1	CHECKED	

CHQ.14.10938 - PL02





REV	DATE	BY
CLIENT		

Sainsbury's

PROJECT

Shripney Road
BOGNOR REGIS
PO22 9FB

DRAWING

Proposed Site Plan

CHQ
PARTNERSHIP
Architects • Building Surveyors

CHQ Partnership Ltd,
Tannery House, 23 High Street
Baldock, Hertfordshire SG7 6BE
Telephone: (01462) 895110
Facsimile: (01462) 895099
Email: design@chq-architects.co.uk
www.chq-architects.co.uk

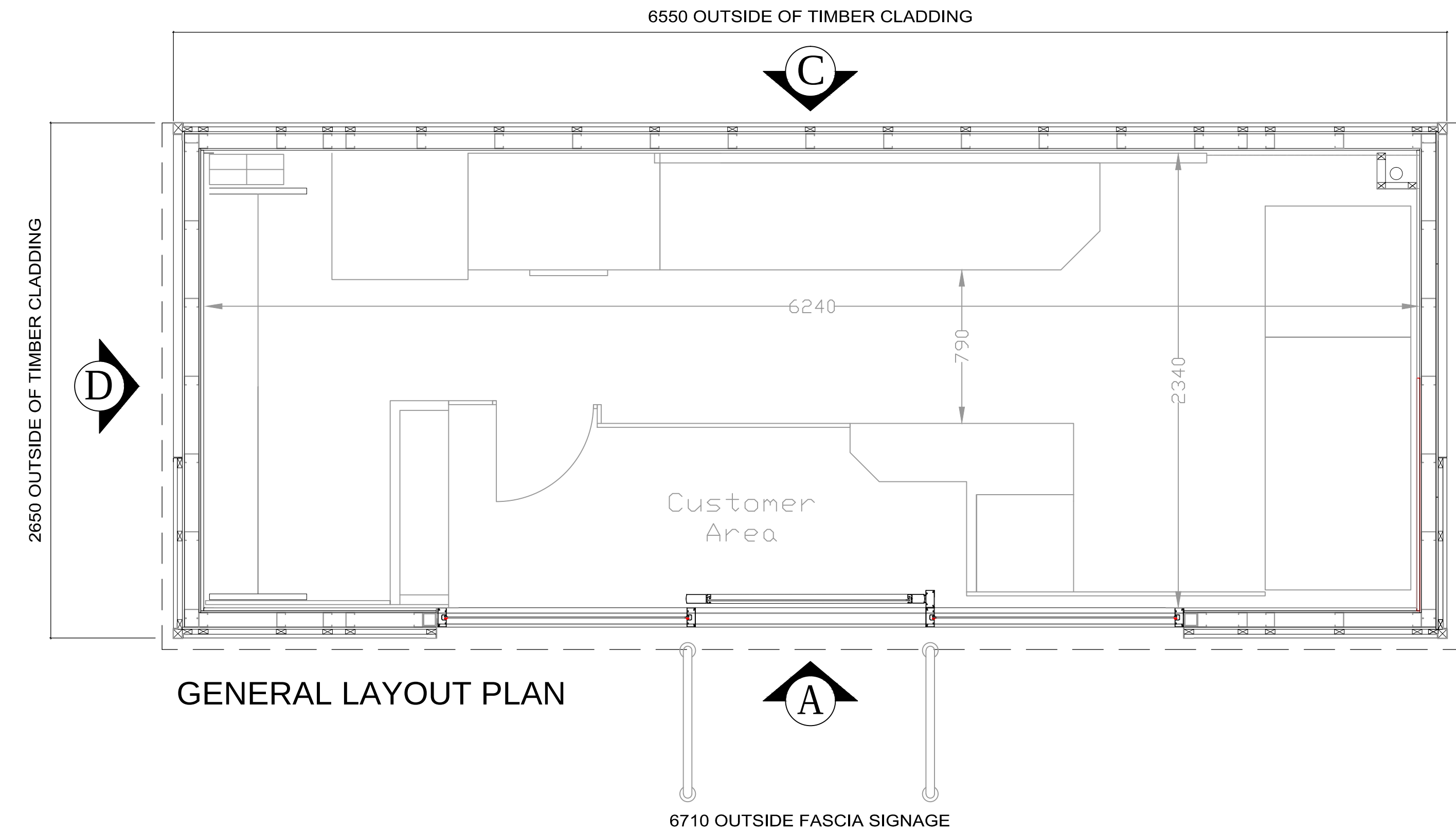
DATE	Sept. 2014	DRAWN	JW
SCALE	1 : 500 @ A1	CHECKED	

CHQ.14.10938 - PL03

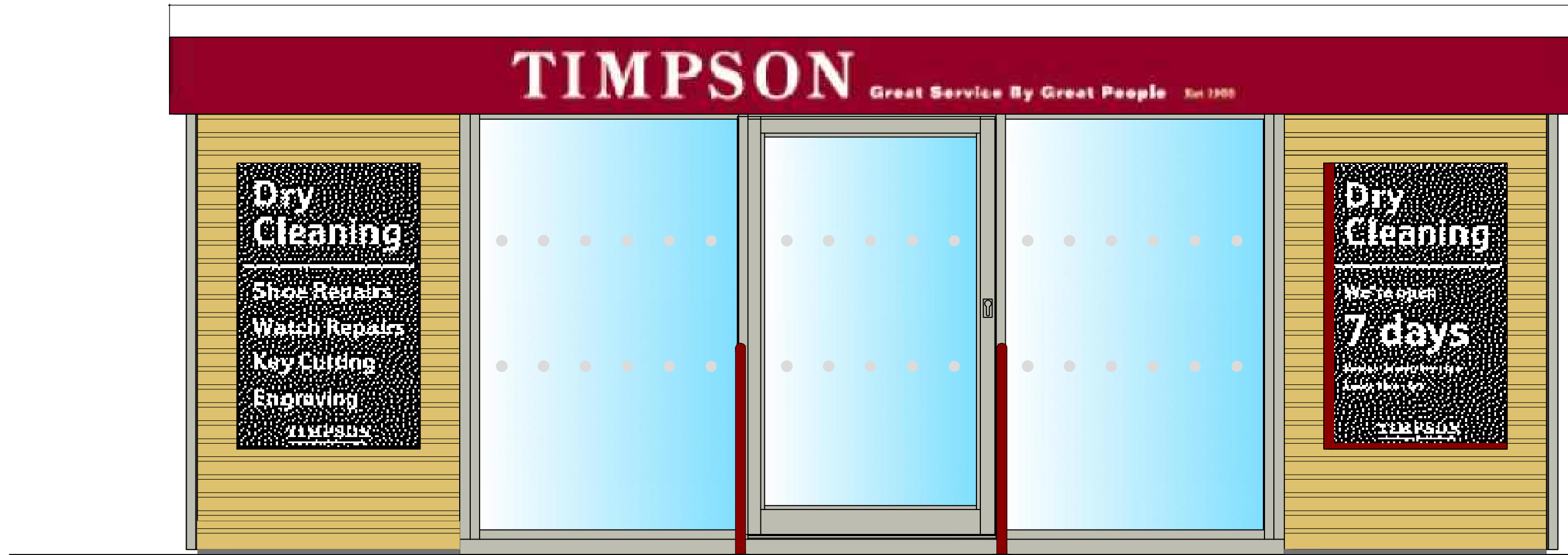
BOGNOR REGIS

PLANNING

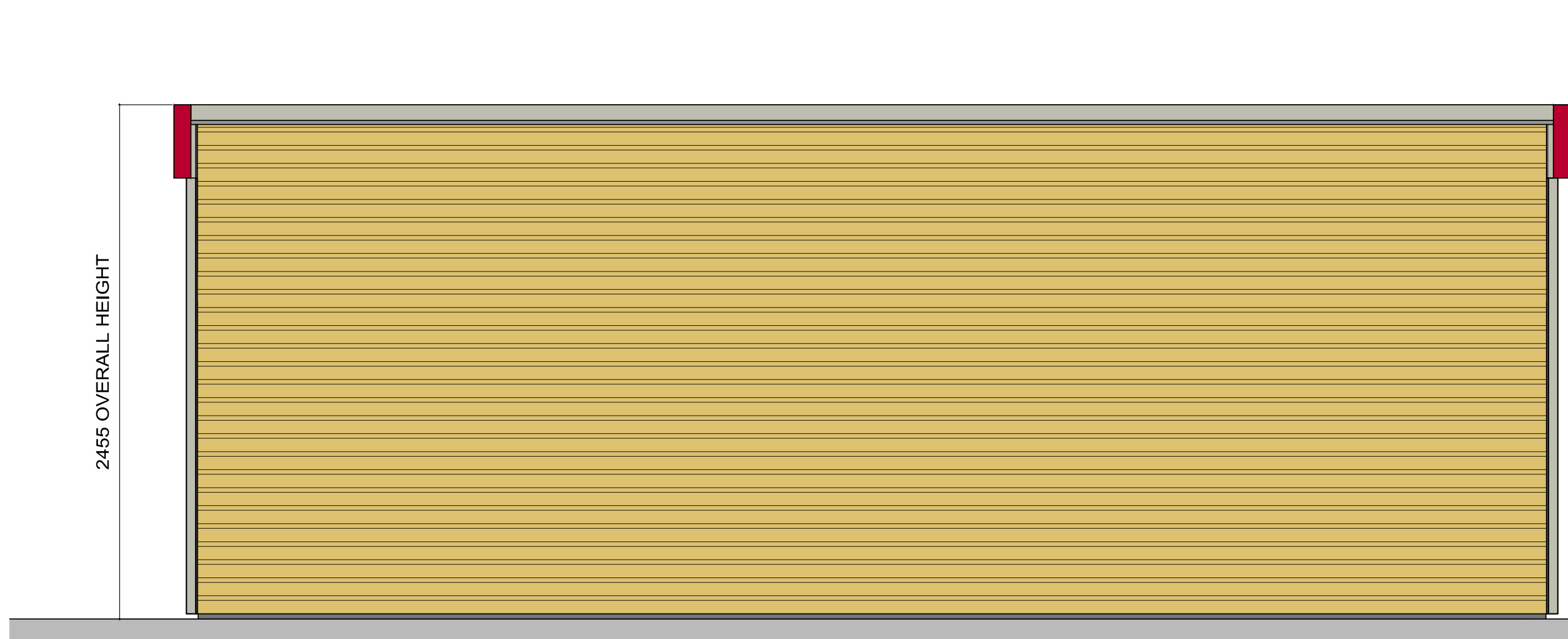
PROPOSED AREAS	sq ft	sq m
Gross Internal Area	156 sq ft	14.5 sq m
Gross External Area	187 sq ft	17.4 sq m



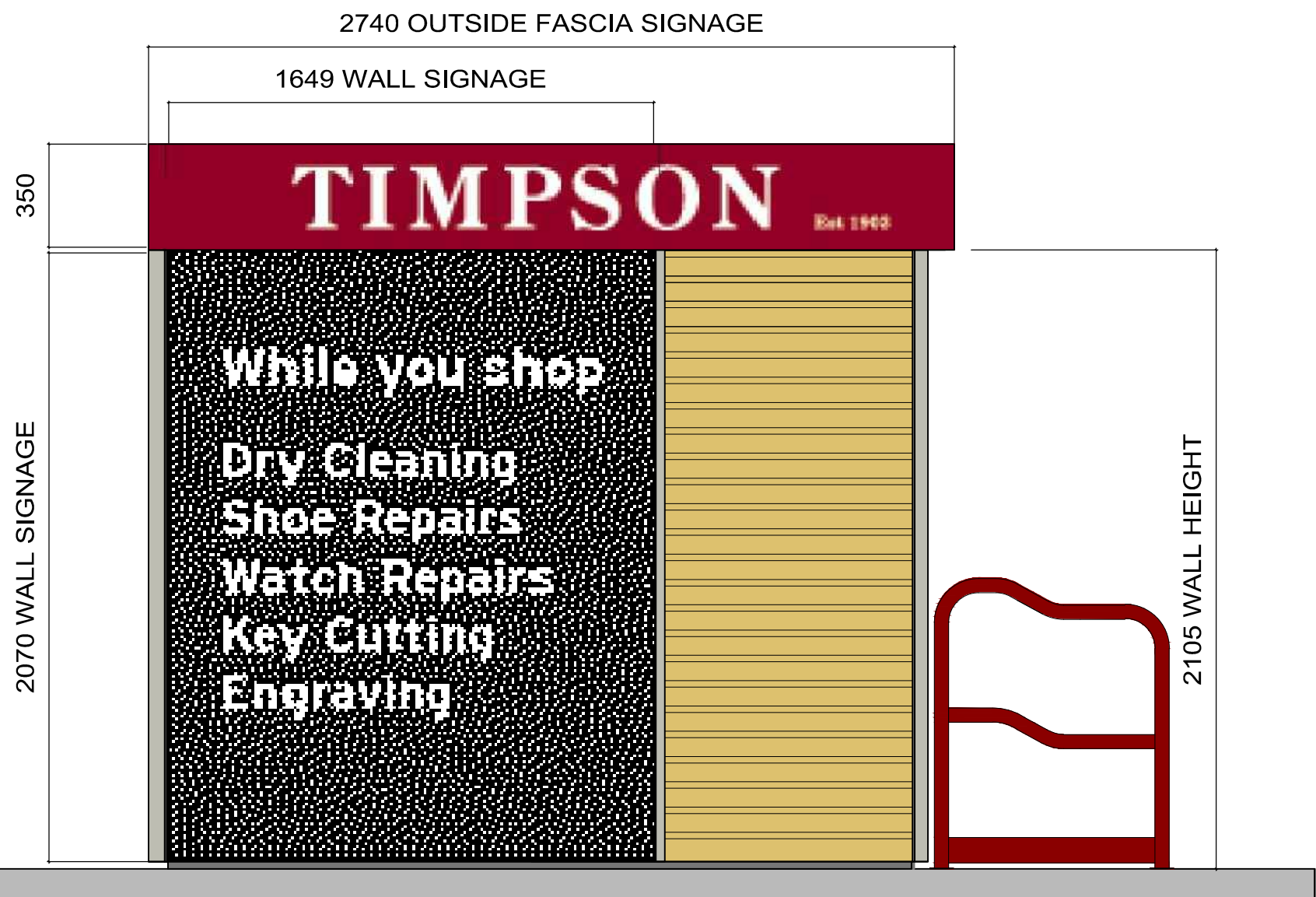
Indicative Photo of Timpson Pod



ELEVATION B-B



ELEVATION D-D



Floor Construction	
Chassis	Constructed from longitudinal cold rolled main support members 100 x 50 x 3.6mm RHS S355 light gauge steel.
Timber Floor	24mm tongue and grooved WBP plywood laid over joists.
Insulation to all floors	Foil therm insulation bagged to created void.
External Walls	
Core Construction	Constructed from rolled galvanised steel sections. Vertical studs are fixed at circa 600mm centres. Externally one layer of 11mm OSB is fixed to the stud, covered with breather paper which is held in place with 50x50mm battens. Internally a 15mm high performance gypsum board is fixed to the steel stud holding in place insulation. This provides a standard 60 min fire protection to all elements of structure.
External Finish	Powder coated panels (white) to match existing finish with 50x 50mm aluminium angle corner trims.
Internal lining	15mm Megadeco high performance gypsum plasterboard. This is sealed with intumescent mastic to provide 60 minute "in to out" fire protection to all elements of structure.
External Trims	
Fascia	The rear of the modular is finished with a powder coated aluminium fascia. The front and both end walls are to receive signage by the client.
Roof Beam Cappings	Not applicable
External Door / Screens	
Generally	Constructed from aluminium framework approx 3826mm wide x 2147mm high, consisting of a fixed side screen either side of a central opening, an automatic single sliding door to fit in the central framework, complete with a combined radar / threshold sensors to BS7036.
	The aluminium door will have two no Adam Rite high security lock bolts, 6.4 laminated safety glass no mid-rail and no threshold, the two fixed frames to have 8.8 laminated glass.
	Aluminium extrusions are 6063T6 Alloy to BS 1474.
	Polyester powder coating to be to BS 6496, minimum thickness 40 microns on significant surfaces to a standard white colour and finish.
External handrail	
Handrail	Tubular handrail finished colour burgundy, to match signage, with step (as required to suit site levels) to front of pod.

REV	DATE	BY
CLIENT		

Sainsbury's

PROJECT

Shripney Road
BOGNOR REGIS
PO22 9FB

DRAWING

Proposed Pod Detail

CHQ
PARTNERSHIP
Architects • Building Surveyors

CHQ Partnership Ltd,
Tannery House, 23 High Street
Baldock, Hertfordshire SG7 6BE
Telephone: (01462) 895110
Facsimile: (01462) 895099
Email: design@chq-architects.co.uk
www.chq-architects.co.uk

DATE	Sept. 2014	DRAWN	JW
SCALE	1 : 20 @ A1	CHECKED	

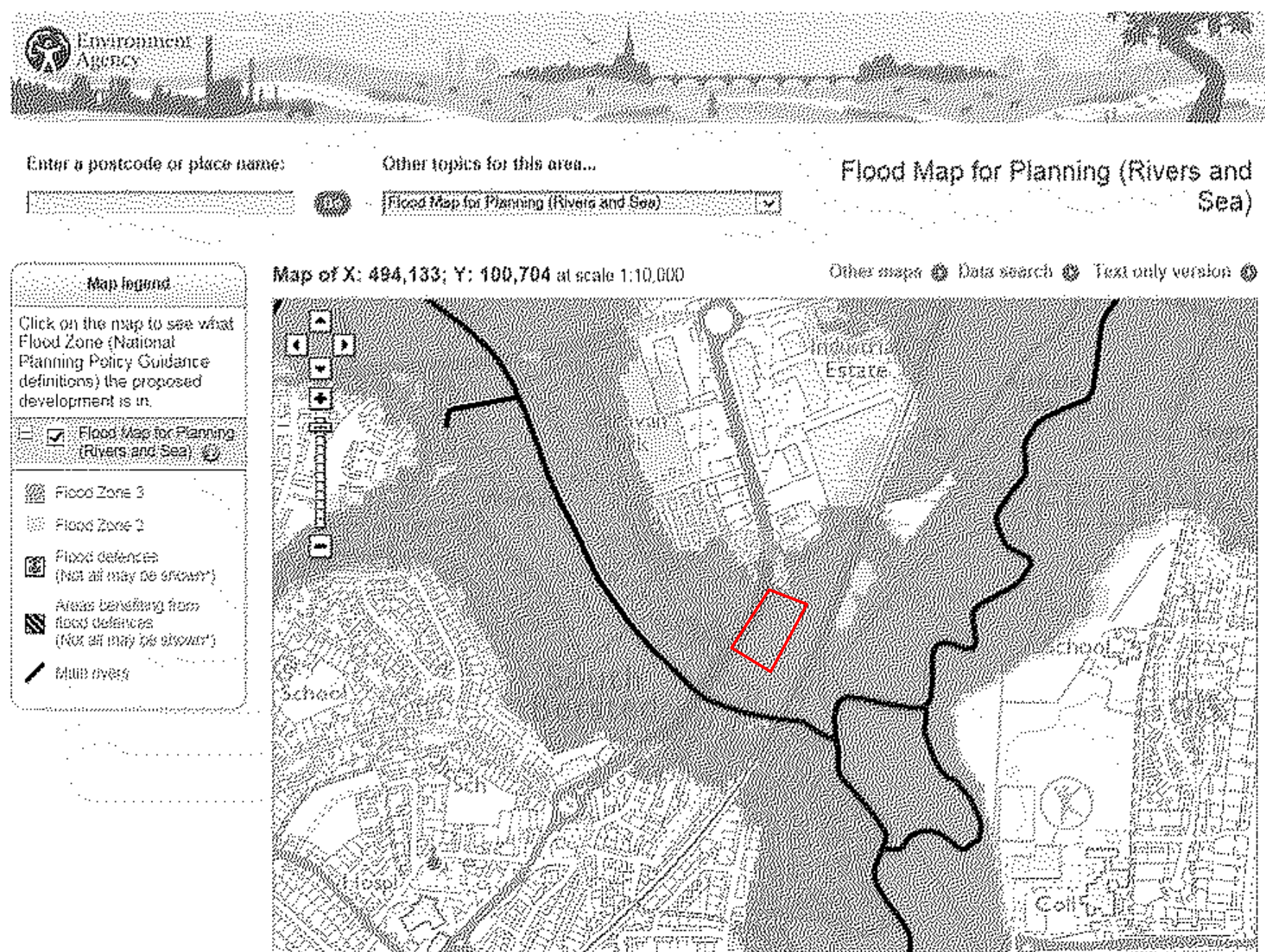
CHQ.14. 10938 - PL05



APPENDIX C

Environmental Agency's Indicative Flood Risk Map

Appendix C: Flood Map for Planning



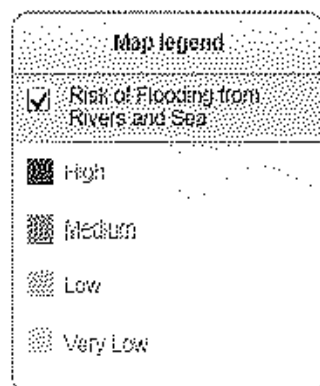
Appendix C: Risk of Flooding from Rivers and Sea

Risk of Flooding from Rivers and Sea

River flooding happens when a river cannot cope with the amount of water draining into it from the surrounding land. Sea flooding happens when there are high tides and stormy conditions.

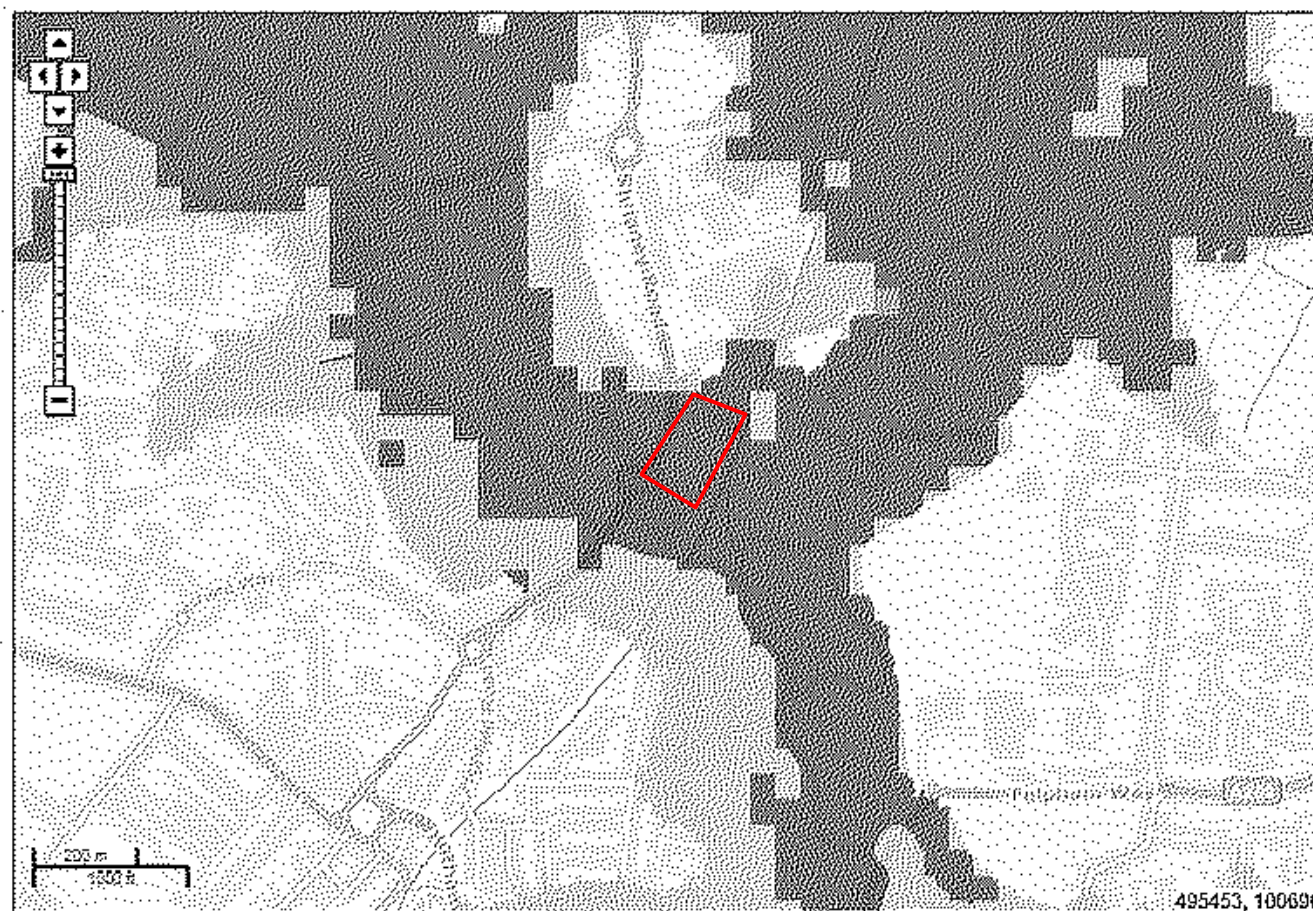
The shading on the map shows the risk of flooding from rivers and the sea in this particular area.

Click on the map for a more detailed explanation.



Map of X: 494,133; Y: 100,704 at scale 1:10,000

Data search 



Appendix C: Risk of Flooding from Surface Water

Enter a postcode or place name:



Other topics for this area...

Risk of Flooding from Surface Water

[View other interactive maps](#)

Risk of Flooding from Surface Water

Surface water flooding happens when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead.

The shading on the map shows the risk of flooding from surface water in this particular area.

Click on the map for a more detailed explanation.

Map legend

☒ Risk of Flooding from Surface Water

 High

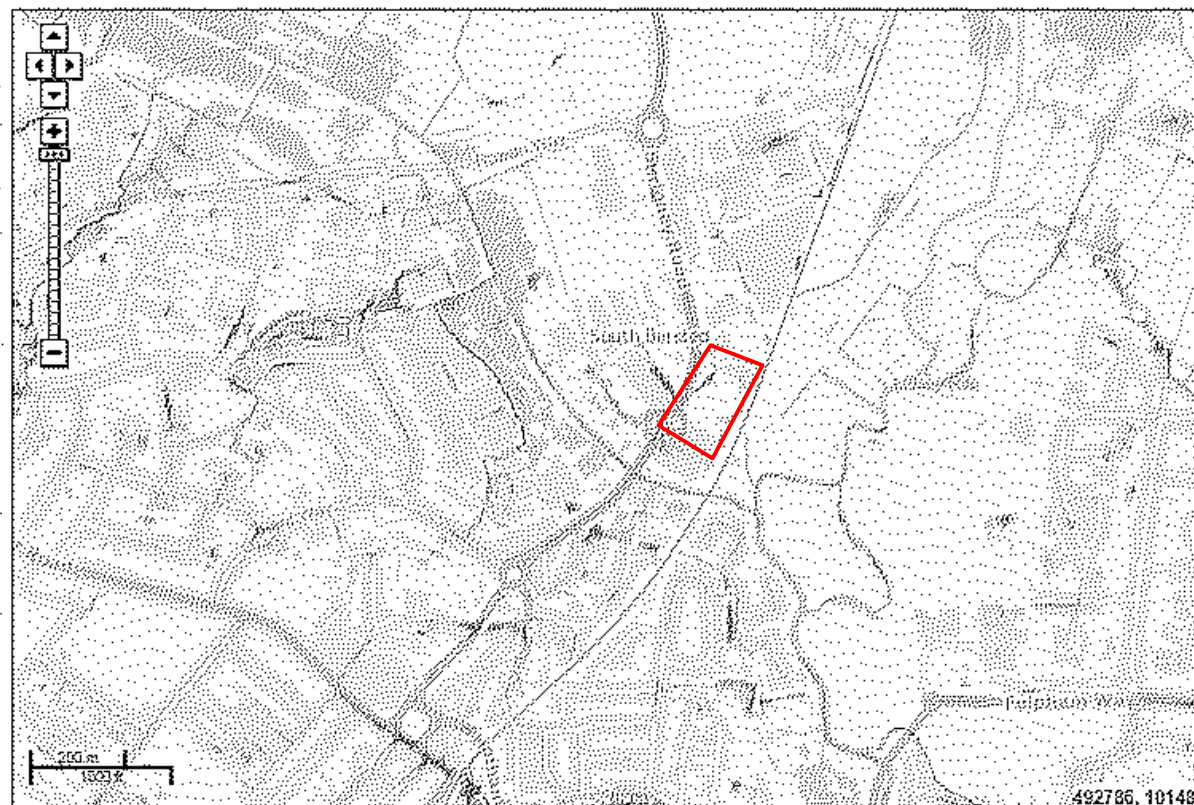
 Medium

 Low

 Very Low

Map of X: 493,954; Y: 100,703 at scale 1:10,000

[Data search](#) 



Customers in Wales - From 1 April 2013 Natural Resources Wales (NRW) will take over the responsibilities of the Environment Agency in Wales.
© Environment Agency copyright and database rights 2014. © Ordnance Survey Crown copyright. All rights reserved. Environment Agency, 100020000.
Contains Royal Mail data © Royal Mail copyright and database right 2014.
This service is designed to inform members of the public, in line with our terms and conditions. For business or commercial use, please contact us.



APPENDIX D

SFRA Maps



Notes:

The Arun SFRA is a strategic assessment of flooding. Users of the SFRA should be aware of this when interpreting the information presented. The user is directed to the SFRA reports which outline the uncertainties associated with the studies. Particular attention is drawn to the following:

- Flood extent boundaries are not considered definitive. Land adjacent to these areas may also be at risk.
- Some flooding mechanisms have not been included in the assessment. The 'coastal risk area' is based on advice from LA Engineers and requires further assessment.

Arun District Council SFRA

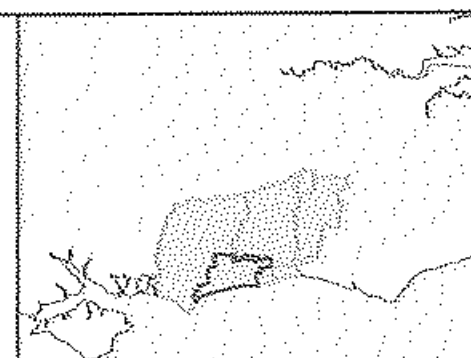
Map F1-F - Fluvial Flood Zone Extents



CAPITA SYMONDS

Legend

- Arun District Boundary
- Zone 3b Fluvial Extent (defended)
- Zone 3a Fluvial Extent (no defences)
- Zone 2 Fluvial Extent (no defences)



0 2 4
Kilometres

Scale at A3: 1:80,000

Date: 31/01/2008

Note the property of this drawing and design is vested in Capita Symonds Limited and must not be copied or reproduced in any way without their written consent. Based on Ordnance Survey mapping and reproduced by Capita Symonds. It is licence no. 100018487 (2008) with the permission of the Controller of Her Majesty's Stationery Office Crown copyright.

Map_F1-F.wor



Notes:

The Arun SFRA is a strategic assessment of flooding. Users of the SFRA should be aware of this when interpreting the information presented. The user is directed to the SFRA reports which outline the uncertainties associated with the studies. Particular attention is drawn to the following:

- Flood extent boundaries are not considered definitive. Land adjacent to these areas may also be at risk.
- Some flooding mechanisms have not been included in the assessment. The 'coastal risk area' is based on advice from LA Engineers and requires further assessment.

Arun District Council SFRA

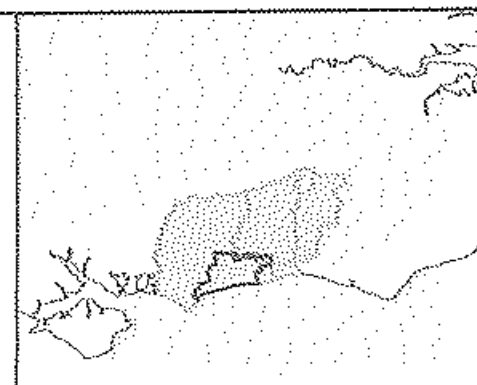
Map A1-F - Actual and Residual Risk of Flooding from Rivers



CAPITA SYMONDS

Legend

- Arun District Boundary
- Actual Defended Fluvial Flood Risk (1% AEP, 2006)
- Residual Defended Fluvial Flood Risk (0.1% AEP, 2006)



0 2 4
Kilometres

Scale at A3: 1:80,000

Date: 31/01/2008

Note the property of this drawing and design is vested in Capita Symonds Limited and must not be copied or reproduced in any way without their written consent. Based on Ordnance Survey mapping and reproduced by Capita Symonds Ltd licence no. 100018487 (2008) with the permission of the Controller of Her Majesty's Stationery Office Crown copyright.

Map_A1-F.wor



Notes:

The Arun SFRA is a strategic assessment of flooding. Users of the SFRA should be aware of this when interpreting the information presented. The user is directed to the SFRA reports which outline the uncertainties associated with the studies. Particular attention is drawn to the following:

- Flood extent boundaries are not considered definitive. Land adjacent to these areas may also be at risk.
- Some flooding mechanisms have not been included in the assessment. The 'coastal risk area' is based on advice from LA Engineers and requires further assessment.

Arun District Council SFRA

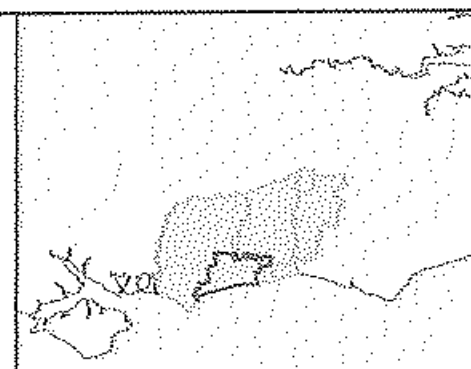
Map A1-T - Actual and Residual Flooding from the Sea



CAPITA SYMONDS

Legend

- Arun District Boundary
- Actual Defended Tidal Flood Risk (0.5% AEP, 2006)
- Residual Defended Tidal Flood Risk (0.1% AEP, 2006)
- Coastal Risk Area



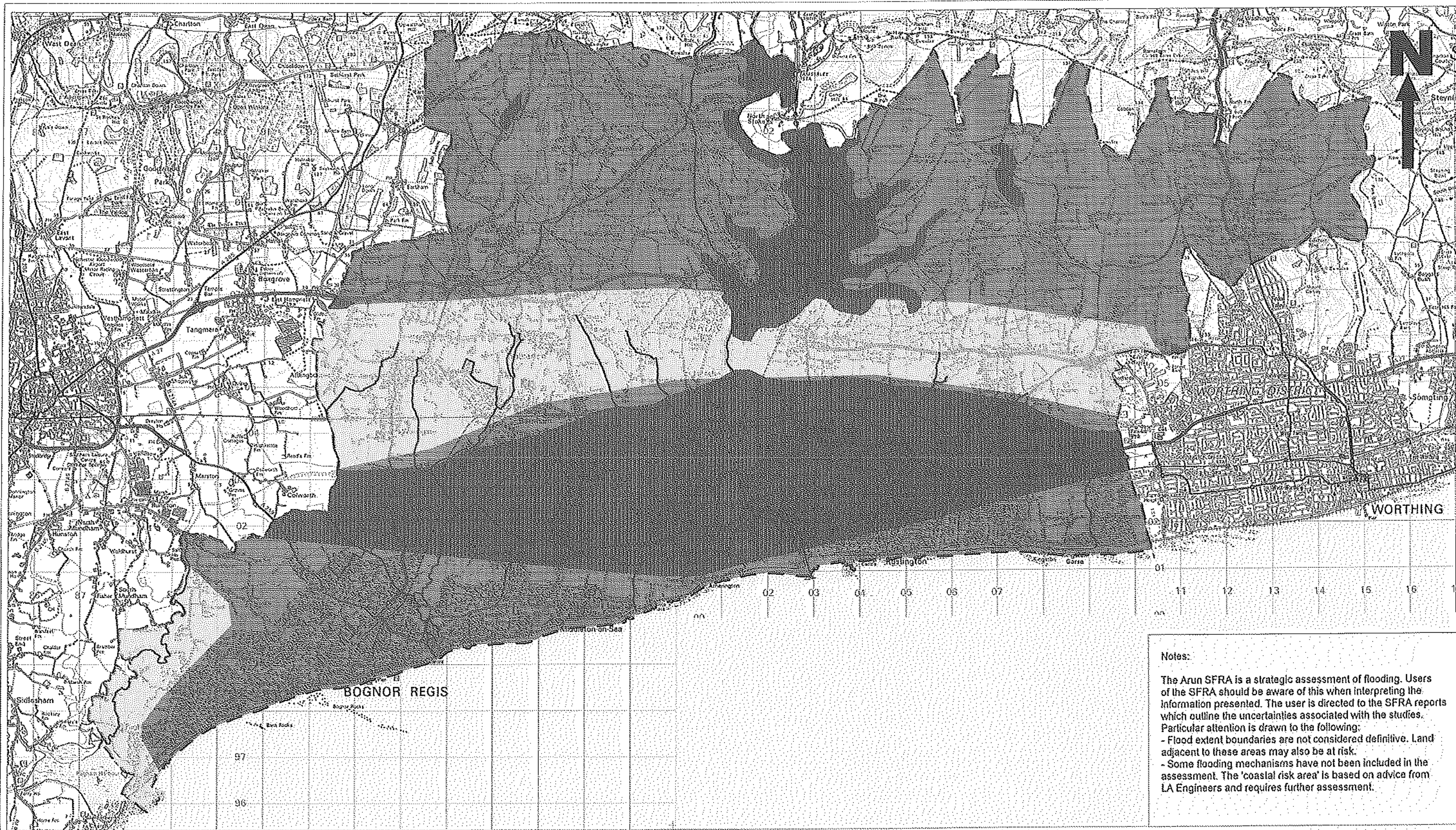
0 2 4
Kilometres

Scale at A3: 1:80,000

Date: 31/01/2008

Note the property of this drawing and design is vested in Capita Symonds Limited and must not be copied or reproduced in any way without their written consent. Based on Ordnance Survey mapping and reproduced by Capita Symonds. Licence no. 100018407 (2008) with the permission of the Controller of Her Majesty's Stationery Office Crown copyright.

Map_A1-T.wor



Notes:

The Arun SFRA is a strategic assessment of flooding. Users of the SFRA should be aware of this when interpreting the information presented. The user is directed to the SFRA reports which outline the uncertainties associated with the studies. Particular attention is drawn to the following:

- Flood extent boundaries are not considered definitive. Land adjacent to these areas may also be at risk.
- Some flooding mechanisms have not been included in the assessment. The 'coastal risk area' is based on advice from LA Engineers and requires further assessment.

Arun District Council SFRA

Map G1 - Indicative Risk of Groundwater Flooding



CAPITA SYMONDS

Legend

Arun District Boundary

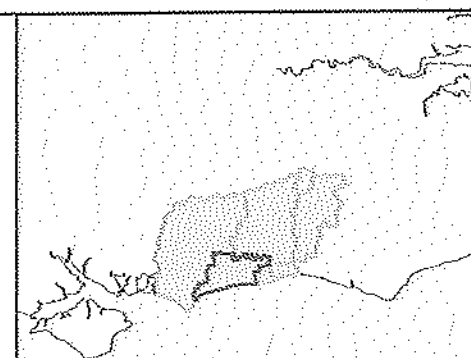
Main River

Groundwater Emergence Zones

Groundwater Flood Risk

High

Medium



0 2 4
Kilometres

Scale at A3: 1:80,000

Date: 31/01/2008

Note the property of this drawing and design is vested in Capita Symonds Limited and must not be copied or reproduced in any way without their written consent. Based on Ordnance Survey mapping and reproduced by Capita Symonds Ltd licence no. 100018487 (2008) with the permission of the Controller of Her Majesty's Stationery Office Crown copyright.

Map_G1.wor



Notes:

The Arun SFRA is a strategic assessment of flooding. Users of the SFRA should be aware of this when interpreting the information presented. The user is directed to the SFRA reports which outline the uncertainties associated with the studies. Particular attention is drawn to the following:

- Flood extent boundaries are not considered definitive. Land adjacent to those areas may also be at risk.
- Some flooding mechanisms have not been included in the assessment. The 'coastal risk area' is based on advice from LA Engineers and requires further assessment.

Arun District Council SFRA

Map H - Historic Flood Events



CAPITA SYMONDS

Legend

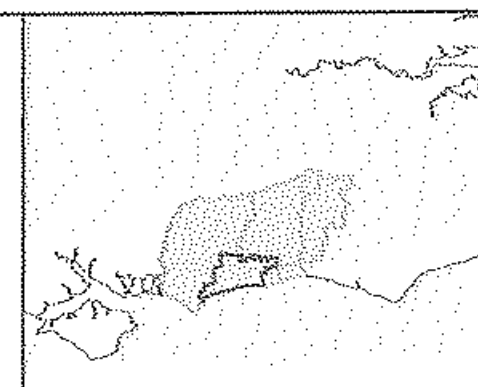
— Arun District Boundary

Historic Flood Events - Points

- Coastal
- Tidal
- Fluvial
- Surface Water
- Sewer
- Failure
- Unknown

Historic Flood Events - Areas

- ▨ Coastal
- ▨ Tidal
- ▨ Fluvial
- ▨ Surface Water
- ▨ Unknown



0 2 4
Kilometres

Scale at A3: 1:80,000

Date: 31/01/2008

Note the property of this drawing and design is vested in Capita Symonds Limited and must not be copied or reproduced in any way without their written consent. Based on Ordnance Survey mapping and reproduced by Capita Symonds Ltd licence no. 100018487 (2008) with the permission of the Controller of Her Majesty's Stationary Office Crown copyright

Map_Hwor



APPENDIX E

Southern Water Asset Maps

1. DO NOT SCALE: CONTRACTOR TO CHECK ALL DIMENSIONS AND REPORT ANY OMISSIONS OR ERRORS
2. ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS NOTED OTHERWISE

SAINSBURYS BOUNDARY
SINE DARBY BOUNDARY

ELECTRICAL CABLES
WATER PIPELINE
FOUL WATER
SURFACE WATER
GAS PIPELINE

33	BOUNDARY UPDATED	MM	LF	LF	01.12.03
52	BOUNDARIES AMENDED	MM	LF	LF	28.11.03
01	REPORT ISSUE	GB	MD	-	24.10.2003
REV	DESCRIPTION	BY	CHK	APP	DATE

1231 ANDREWS CRESCENT
CAROLFF : : :
GE 10 300 : : :

ISSN: 0013-788X/2012/1143
 FASC: 0013/23 2012/1843
 e-issn: 0013/23/2012/1843

Pick

RE-DEVELOPMENT OF FORMER LEC SITE,
BOGNOR REGIS

Drawing Tools

EXISTING SERVICES

Specs	Drawn	Date	Checked	Date	Approved	Date
1.1253	03	21.10.2003	KD	21.10.2003		
Project No.	Location	Type	Drawing No.	Revision		
A050949	34	01	FIG. 3	03		



APPENDIX F

Existing Drainage



Journal of Management Education 30(6)p. 789-804
© The Author(s) 2006
Reprints and permissions:
<http://www.sagepub.com/journalsPermissions.nav>

20345		28506		00404		F	
-------	--	-------	--	-------	--	---	--