civils ltd - consulting engineers

FLOOD RISK ASSESSMENT

Land off Plover Road
Minster, Sheppey

CLIENT
Dalemarch (Sheppey) Ltd
No 1 Lonsdale Gardens
Tunbridge Wells
Kent
TN1 1NU

Ref: 3995/2.3F
Date: May 2012

CONSULTING ENGINEERS
gta civils ltd
Gloucester House
66a Church Walk
Burgess Hill
West Sussex
RH15 9AS

Tel: 01444 871 444
Fax: 01444 871 401

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Report by: **Stephen Lamprell, BEng (Hons)**
Checked by: **Martin Roberts I Eng, ACIWEM, MCIHT**

Issue	Date	Compiled	Checked
First Issue	21/6/12	SDL	MR
Rev A	19/7/12	SDL	MR
Rev B	02/07/15	JP	MR

1.0 INTRODUCTION

1.1 **gta** civils ltd was appointed by the client, Dalemarch (Sheppey) Ltd, to carry out a flood risk assessment in respect of building 105 new residential dwellings on the land off Plover Road, Minster, Sheppey, ME12 3DZ. This report has been prepared for Dalemarch Sheppey Ltd for the above development and no responsibility is accepted to any third party for all or part of this study in connection with this or any other development.

1.2 This report will take the form of a formal Flood Risk Assessment in accordance with the 2012 National Planning Policy Framework (NPPF) and the associated Technical Guidance document (TG), both contained within the 2014 Planning Practice Guidance (PPG).

1.3 The Planning Application is for the construction of 105 new residential dwellings with associated drives and gardens.

1.4 There is also a planning application for a food store and retail units associated with the site. However, this FRA is only for the residential site, and does not cover the retail site.

2.0 EXISTING SITE AND CURRENT FLOOD CONDITIONS

2.1 The site is currently a vacant, greenfield site which is bounded to the northwest by Parish Road, and to the south by the proposed food store and retail site, and an existing residential site. Along the eastern boundary is an un-named ditch, on the other side of which is a residential site. To the northeast of the site is agricultural land.

2.2 The area of the existing site is approximately 28,726m^2 (2.87 Ha) and is accessed off Plover Road. It lies within the area administered by Swale Council.

2.3 The site slopes from south to north. It ranges in level from 16m AOD at the south western corner to 7m AOD at the north eastern corner.

2.4 The existing site levels are indicated on Sitech's drawings no. 2887B/04 in Appendix B.

2.5 The Environment Agency's rivers and seas flood map (in Appendix D) shows that the site is within Flood Zone 1 (FZ1). The annual probability of fluvial (river) or tidal (sea) flooding is less than 0.1%, ie it is outside the '1 in 1000 years' flood zone.

2.6 The Strategic Flood Risk Assessment commissioned by Swale Council shows that the site is outside of any Flood risk during a breach of sea defences, as shown on the maps in Appendix F.

2.7 Surface Water Flooding: the EA's online surface water flood map shows that the site is largely removed from this risk – see map in Appendix D. The units closest to the SE and NE boundaries are liable to flood in the extreme event, however: the ramifications of this will be outlined in the next section.

2.8 The SFRA contains a map (see Appendix F) showing the recorded incidences of flooding. The site is approximately 400m from the nearest recorded flood (1953) and is in the region classed as 'low probability'.

2.9 The site is underlain with London Clay according to geological records, and is therefore likely to have low permeability into the soil.

2.10 The current site is free draining to the ditch to the ditch along the east of the site and to the land to the north, which subsequently drains to a stream along its northern boundary.

2.11 The adjacent existing social housing site off Yarrow Drive and Clover Close, is currently draining to the ditch which runs across the proposed food store site. The surface water run-off from this site is restricted to 4 l/s for the roofs and parking courts, and a further 4 l/s restricted outfall for the highway drainage.

2.12 From a visit to site it was noted that the existing shallow ditch draining this estate and running along the Eastern boundary, becomes shallower and shallower until it eventually disappears half way down the this boundary. The water from the South therefore just drains onto the land and soaks away or ends up in the stream finding its own route.

3.0 PROPOSED SITE LAYOUT AND DRAINAGE DESIGN

3.1 The proposal is to build 105 new residential dwellings with associated garages and drives.

3.2 The total buildings' footprint (ie roofed) area, plus hardstanding and roads is approximately 14,637m^2.

3.3 The proposed access is off Plover Road into the north western corner of the site.

3.4 As the site is Flood Zone 1 there is negligible risk of fluvial or tidal flooding. The units closest to the southeast and northeast boundaries are liable to flood to a maximum depth of 0.3m in the extreme flood event (see section 2.7). The NPPF states that new developments should be placed above the predicted flood level in the 1 in 1000 years event. It is therefore proposed to set these units' lowest floor level +0.35m above ambient ground levels.

3.5 The proposed surface water drainage design is shown on GTA drawing 3995/SK100. The proposed surface water run-off from the roofs, roads and driveways will discharge into an extended ditch which runs along the eastern boundary, via a flow limiting device such as a Hydrobrake. The flow will be limited to the existing green field runoff rate of 31l/s. Rural run-off has been calculated by the use of Micro Drainage ICP SUDS software and the flow rate of 31l/s is the peak Q100 flow off the site. This has been agreed in principle by Joseph Williamson from the Environment Agency in his email dated 11th May 2012. (see Appendix D)

3.6 The proposed strategy is to attenuate the surface water run-off rate using a wide swale at the lower end of the site, plus ponds, sized to hold the critical 1 in 100 years plus 30% climate change storm event. The Micro Drainage calculation is shown in Appendix E. The volume of attenuation will be nominally 780m^3 capacity for the whole development including the food store.

3.7 In accordance with item 3.5, the surface water drainage strategy drawing SK100 in Appendix C shows a controlled total outfall into the existing ditch at 31 l/s. An allowance of 6 l/s controlled outfall has been shown from the food store and car park. The residential site has therefore been shown to have a controlled outfall of 25 l/s into the existing ditch.

3.8 The total run-off area from the residential site roof drainage and adoptable roads is 1.158 ha. The total required attenuation from the residential site is 495 cu.m. The majority of the storage (435cu.m) can be accommodated in the swale at the northern lower end of the site, as shown on drawing SK100 in appendix C. The remainder of the storage (60 cu.m) can be accommodated in the two ponds at the southern end of the site as shown on the drawing SK100.

3.9 The private driveways and parking courts are proposed to be provided with permeable paving. Although the sub-soil has a low permeability, deepened voided sub-bases will be provided to store the peak 1 in 100 year storm + 30% along with a further 50% due to the low permeability.

3.10 The existing ditch which runs across the proposed food store site is proposed to be diverted, as shown on drawing sk100, to form the boundary between the proposed food store site and the proposed residential site, in order to maintain the watercourse, which serves the existing social housing site off Yarrow Drive.

3.11 The extended existing ditch which runs along the eastern boundary of the proposed residential site will need to be connected through to the existing stream north of the site. It is proposed to culvert this section as shown on drawing SK100 via a 450mm diameter pipe. As this will run through third party land, a negotiated permission will be sought with the landowner. If this cannot

be achieved, then an application can be made for Southern Water to install the culvert via a Section 98 requisition.

3.12 A Level 1 foul capacity check has been carried out by Southern Water on the existing local foul sewer network. The results have been returned which state that there is insufficient capacity at present, due to the recent developments nearby. Therefore a Level 2 capacity check will be required on this site, with possible upgrading works of the existing sewer network under a Section 98 agreement, before the proposed foul drainage from the site can be connected.

4.0 SUMMARY AND CONCLUSIONS

4.1 The proposed development is to erect 105 new residential dwelling units on a vacant plot of land to the east of Parish Road, north of Plover Road.

4.2 The Environment Agency's flood map shows that the site is within fluvial Flood Zone 1 (FZ1). The annual probability of fluvial (river) flooding is less than 0.1%, ie it is outside the '1 in 1000 years' flood zone.

4.3 The units nearest to the SE and NE boundaries shall be set 0.35m above ambient levels. The surface water flood map (in Appendix D) shows that these are liable to flood to a maximum depth of 0.3m in the 1 in 1000 years storm.

4.4 The Strategic Flood Risk Assessment commissioned by Swale Council shows that the site is outside of any Flood risk during a breach of sea defences, as shown on the maps in Appendix F.

4.5 The site is underlain with London Clay according to geological records, and is therefore likely to have low permeability into the soil.

4.6 The proposed surface water strategy is to discharge into the existing ditch which runs adjacent to the site, with a restricted outflow of 31l/s, based on the calculated green field run-off.

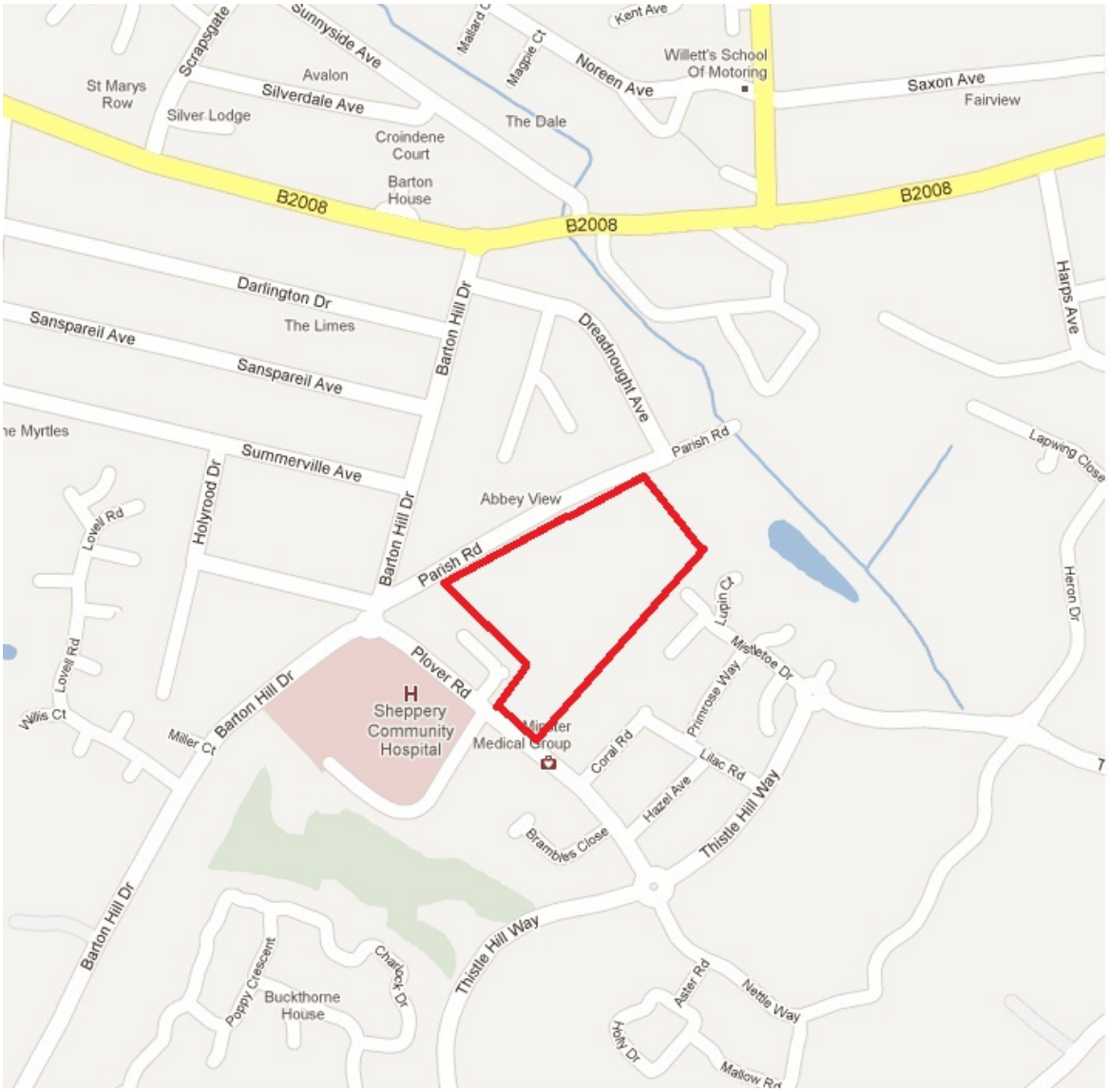
4.7 The surface water run-off is proposed to be attenuated to accommodate a 1 in 100 year storm event, plus 30% climate change. The proposal is to utilise a range of SUDS measures, such as swales, ponds and permeable paving, as shown on drawing SK100 in Appendix C. In this way, run-off from the proposed site will be well managed and controlled, improving water quality and flooding due to SUDS train.

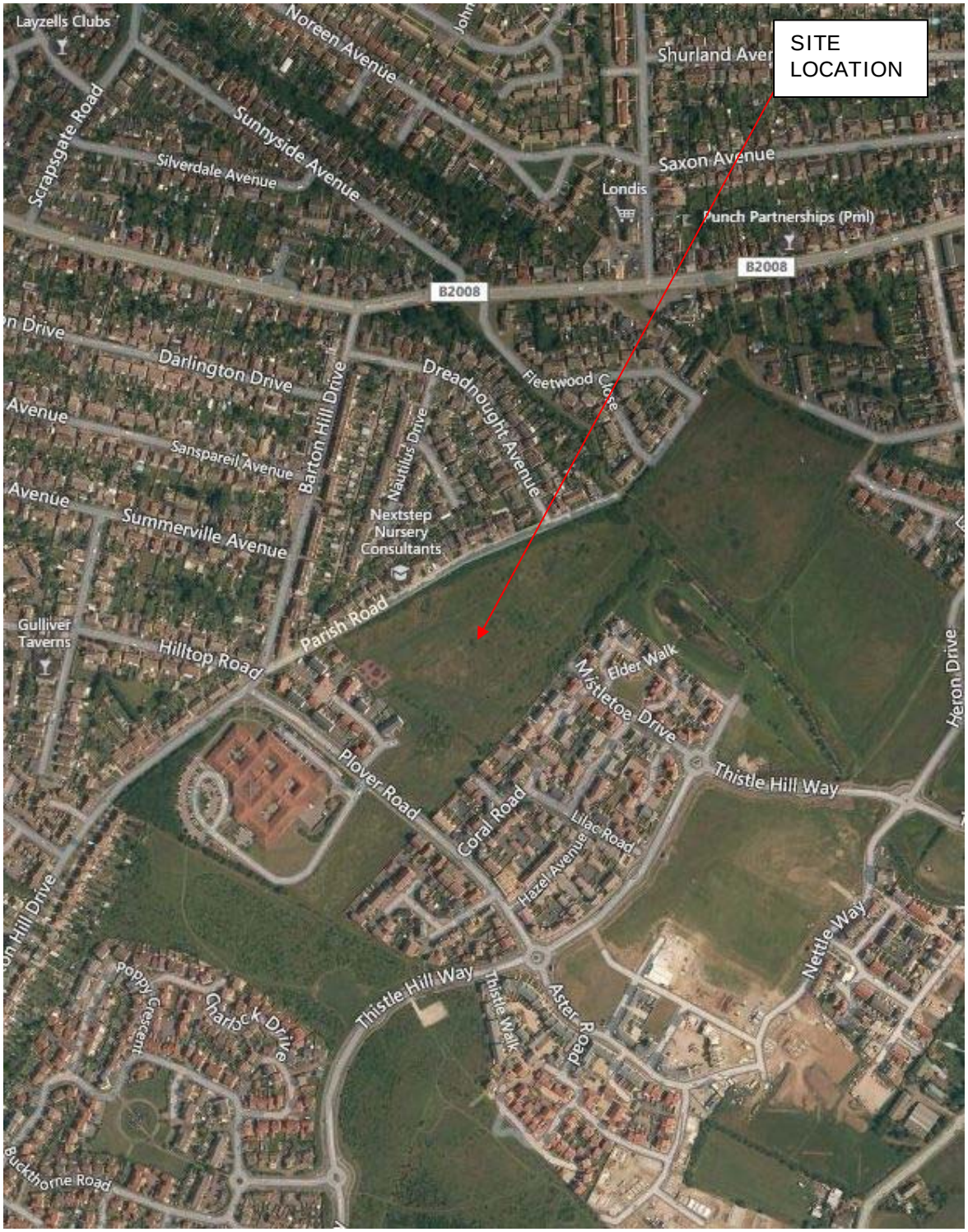
4.8 There will be no increase in flood risk on this or neighbouring sites as a result of this development.

It is therefore considered that this development is NPPF/PPG compliant.

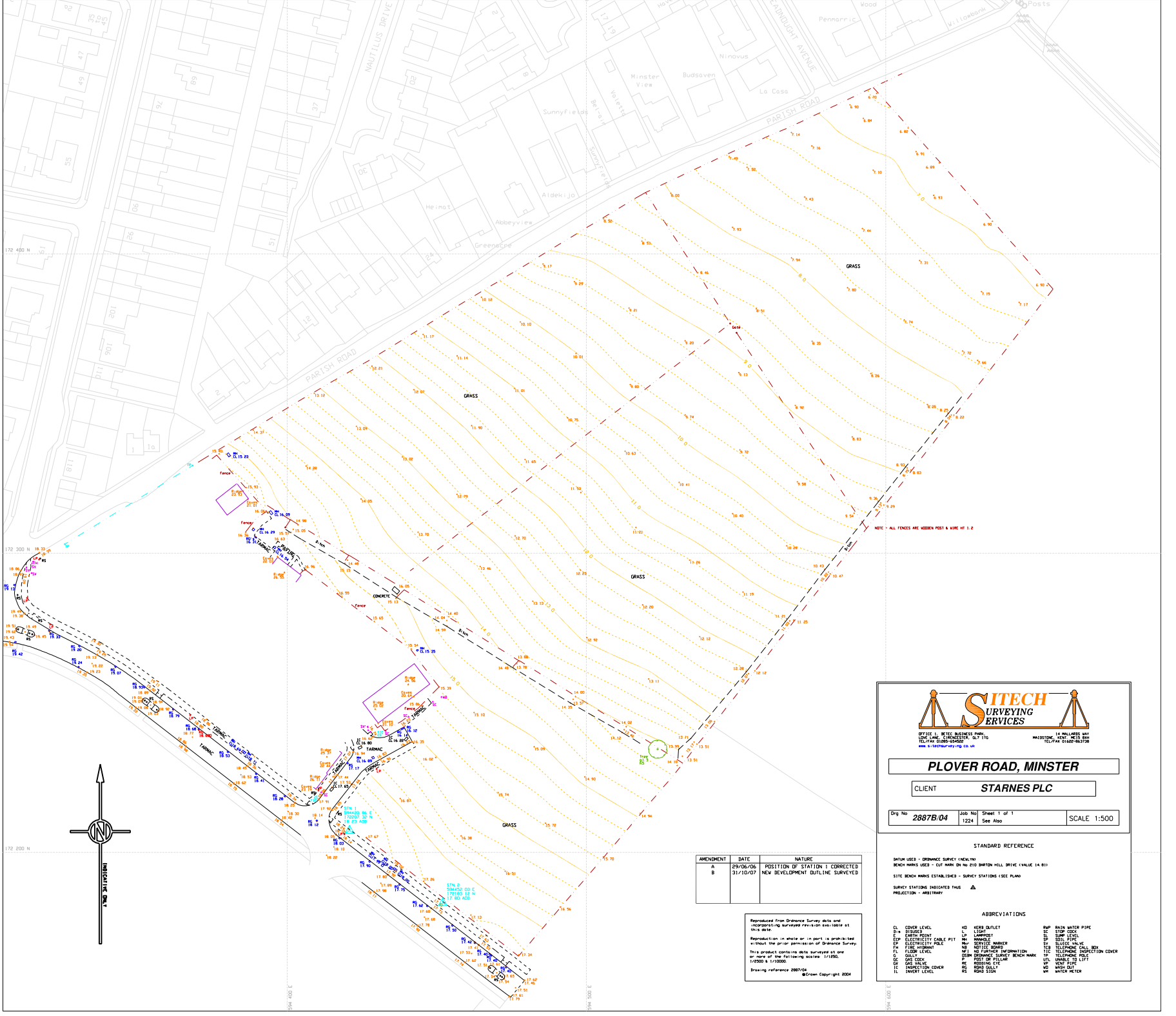
- End of Report –

APPENDIX A: Site Location Plan & Aerial Photo




SITE LOCATION
Layzells Clubs
Noreen Avenue
Shurland Aver
Scrapsgate Road
Sunnyside Avenue
Silverdale Avenue
Saxon Avenue
Londis
Punch Partnerships (Pml)
B2008
B2008
Darlington Drive
Dreadnought Avenue
Fleetwood Close
Barton Hill Drive
Nautilus Drive
Sanspareil Avenue
Summerville Avenue
Nextstep Nursery Consultants
Parish Road
Gulliver Taverns
Hilltop Road
Elder Walk
Mistletoe Drive
Heron Drive
Plover Road
Thistle Hill Way
Coral Road
Lilac Road
Hazel Avenue
Nettle Way
Thistle Hill Way
Thistle Walk
Aster Road
Poppy Crescent
Charlock Drive
Buckthorne Road

APPENDIX B: Topographical Survey



AMENDMENT	DATE	NATURE
A	29/06/06	POSITION OF STATION 1 CORRECTED
B	31/10/07	NEW DEVELOPMENT OUTLINE SURVEYED

SITECH SURVEYING SERVICES

OFFICE 1, BETEC BUSINESS PARK, LOVE LANE, CIRENCESTER, GL7 1YG
TEL/FAX 01285-654582
www.sitechsurveying.co.uk

14 WALLABIES WAY, MAIDSTONE, KENT, ME15 8AH
TEL/FAX 01622-863738

PLOVER ROAD, MINSTER

CLIENT **STARNES PLC**

Drg No	Job No	Sheet	SCALE
2887B/04	1224	1 of 1 See Also	1:500

STANDARD REFERENCE

DATUM USED - ORDNANCE SURVEY (NEWLYN)
BENCH MARKS USED - CUT MARK ON No 210 BARTON HILL DRIVE (VALUE 14.81)

SITE BENCH MARKS ESTABLISHED - SURVEY STATIONS (SEE PLAN)

SURVEY STATIONS INDICATED THUS ▲
PROJECTION - ARBITRARY

ABBREVIATIONS

CL	COVER LEVEL	KO	KERB OUTLET	RWP	RAIN WATER PIPE
Dis	DISUSED	L	LIGHT	SC	STOP COCK
E	EARTH POINT	LP	LAMPPOST	SL	SUMP LEVEL
ECP	ELECTRICITY CABLE PIT	MH	MANHOLE	SOP	SOIL PIPE
EP	ELECTRICITY POLE	MM	MILEAGE MARKER	SV	SLUICE VALVE
FH	FIRE HYDRANT	NB	NOTICE BOARD	TCB	TELEPHONE CALL BOX
FL	FLOOR LEVEL	NFI	NO FURTHER INFORMATION	TIC	TELEPHONE INSPECTION COVER
G	GULLY	OSM	ORDNANCE SURVEY BENCH MARK	TP	TELEPHONE POLE
GC	GAS COCK	P	POST OR PILLAR	UTL	UNABLE TO LIFT
GV	GAS VALVE	RE	RODDING EYE	VP	VENT PIPE
IC	INSPECTION COVER	RG	ROAD GULLY	WO	WASH OUT
IL	INVERT LEVEL	RS	ROAD SIGN	WM	WATER METER

APPENDIX C: Proposed Scheme Drawings

Starnes

Proposed Residential Layout

Proposed Residential Development, Land Off Plover Road, Minster Sheppey

Client	Project	Drawing	
Dalemarch Sheppey Ltd	Land Off Plover Road, Minster, Sheppey	Proposed Residential Layout	
		Scale 1:1000 @A3	Drawn By SJB
		Date May 2015	Drawing No. **2279-108**

design bdb

Church Barn, Milton Manor Farm, Ashford Road, Canterbury, CT4 7PP
t: 01227 456699 www.bdb-design.co.uk