



Flood Risk Assessment

Proposed Retirement Living
Bowls Club, Gravesend
AMA887 Rev A
November 2022

Prepared for:
McCarthy and Stone Retirement Lifestyles Limited

amazi

Contents

	Page No.
1 Introduction	1
2 Site Description	2
2.1 Existing	2
2.2 Proposed	4
3 Tidal Flooding	6
4 Surface Water Flooding	8
4.1 National Mapping	8
4.2 Catchment Information	9
4.3 Flood Risks at Site	13
4.4 Flood Mitigation	14
4.5 Flood Management	18
5 Groundwater Flooding	20
6 Summary	21

Appendices

A Location

OS Map

Aerial Map

B Survey

PP/4089/Romford/F1 Topographical Survey

C Proposed Site

LSE-2821-03-AC-01 P7 Proposed Site Layout

D NPPF Planning Practice Guidance Flood Risk and Coastal Change, Table 1

E Services Survey

LSE-2821-0-US-0001A Utility Identification Survey

F Southern Water mapping

Prepared by Leigh Parratt
BEng(Hons) CEng MICE CWEM MCIWEM PCHEP FHEA

Revision A 01 November 2022 (photographs added, replaced drawing in Appendix C)

Revision 0 21 October 2022

1 Introduction

- 1.1 Amazi Consulting Ltd has been instructed by McCarthy and Stone Retirement Lifestyles Limited to prepare this Flood Risk Assessment (FRA) associated with the proposed retirement living development at the former Bowls Club, Milton Road, Gravesend DA12 2QU.
- 1.2 This FRA has been prepared in accordance with National Planning Policy Framework (NPPF), July 2021, and its accompanying gov.uk Planning Practice Guidance (PPG): *Flood Risk and Coastal Change* (2022). It is expected that this report will be reviewed by the relevant authorities as part of the documentation submitted for full planning permission, and the reader will have some understanding of the technical issues relating to development and flood risk.
- 1.3 This FRA report has been prepared for the sole use of McCarthy and Stone Retirement Lifestyles Limited and its contents cannot be copied or relied upon by others, except the planning and drainage authorities, without the written authority of Amazi Consulting Ltd.
- 1.4 This FRA focuses upon the flood risks to the site. It has been undertaken as a desk study and refers to flood data from other sources. This flood data is currently the best available for assessing flood risks at the site. The site surface water drainage has been assessed separately by Infrastructure Design Ltd. This report does not attempt to comment upon the Sequential Test, insurance or for flood events other than as stipulated by planning policy. There is always the risk, however small, that flooding could be different to that assessed.

2 Site Description

2.1 Existing

2.1.1 The 0.68 hectare (ha) development site is centred at approximate Ordnance Survey (OS) national grid reference 565740 mE, 173780 mN. The site location is shown on the plan in Appendix A and in Figure 2.1.

2.1.2 The site is within the jurisdiction of Gravesend Borough Council and Kent County Council.

2.1.3 The existing site levels are given on the site topographical surveys in Appendix B. The levels shown on the surveys relate to OS GPS datum (mAOD). The ground levels are shown to vary from 10.5 mAOD at the west of the site to 6.15 mAOD at the east of the north boundary. The bowling green is level at 7 mAOD. Contours of the existing site survey are shown on Figure 2.2.

2.1.4 The existing site comprises a former bowls club.

2.1.5 The existing land use is classified as *less vulnerable* in accordance with National Planning Policy Framework (NPPF, 2021) Annex 3.

*Refer to NPPF Table in Appendix D

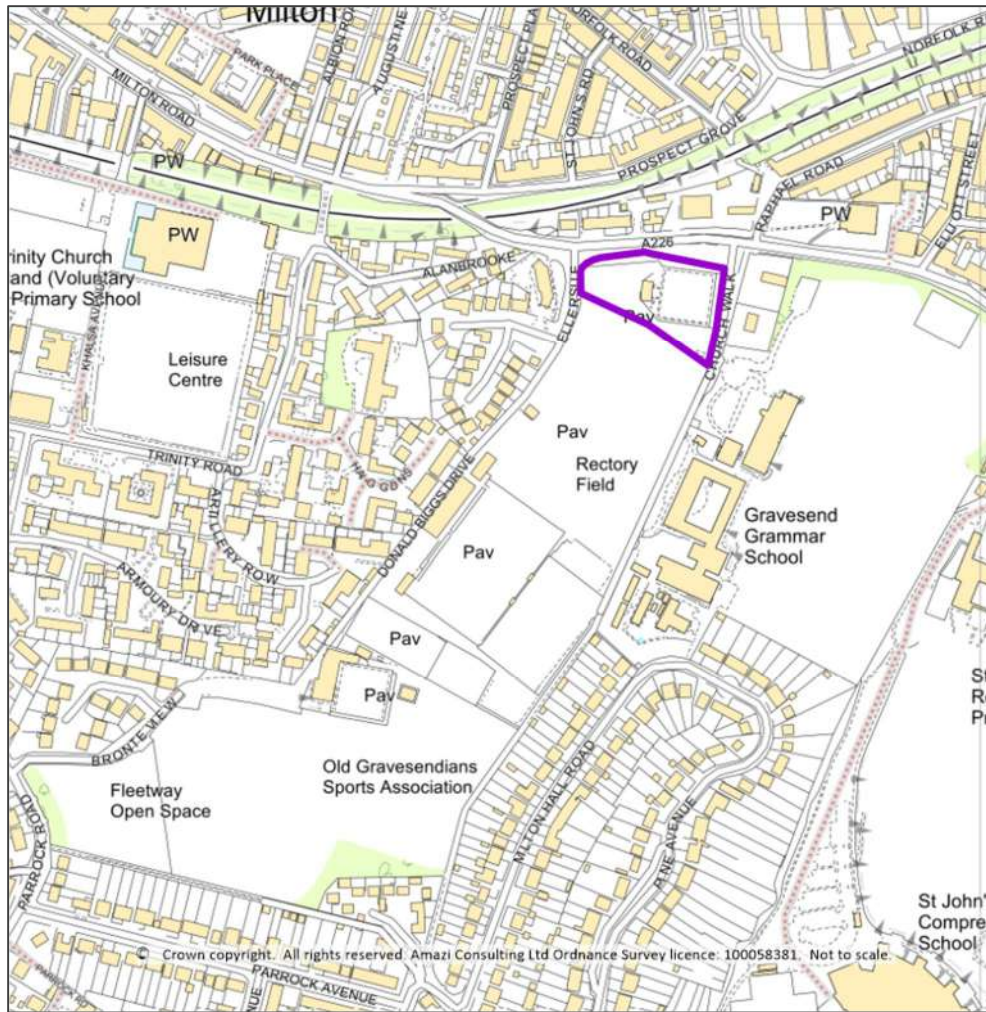


Figure 2.1 - Site Location

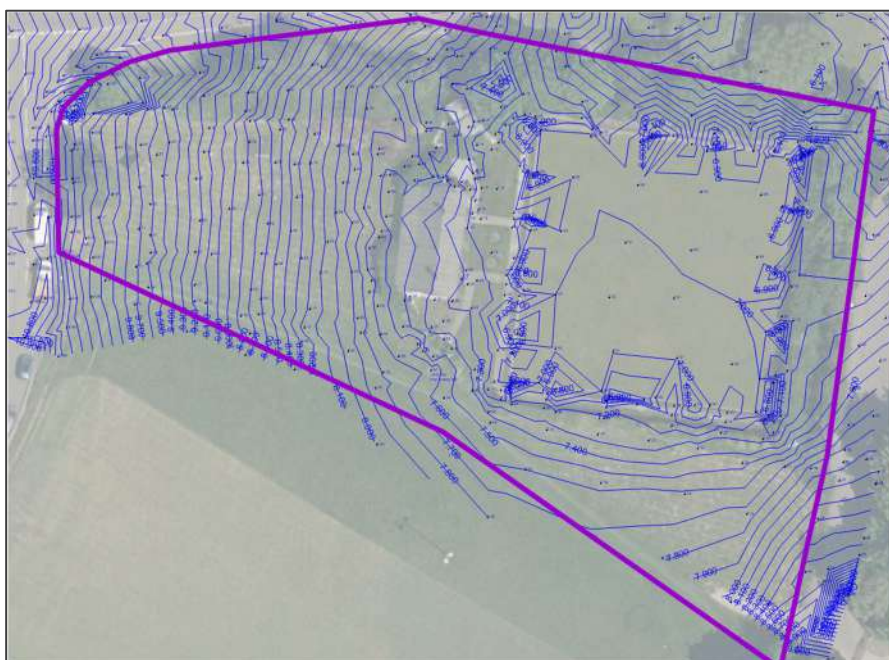


Figure 2.2 - Survey contours

(Source: 4081 – GravesEnd – F1.dwg)

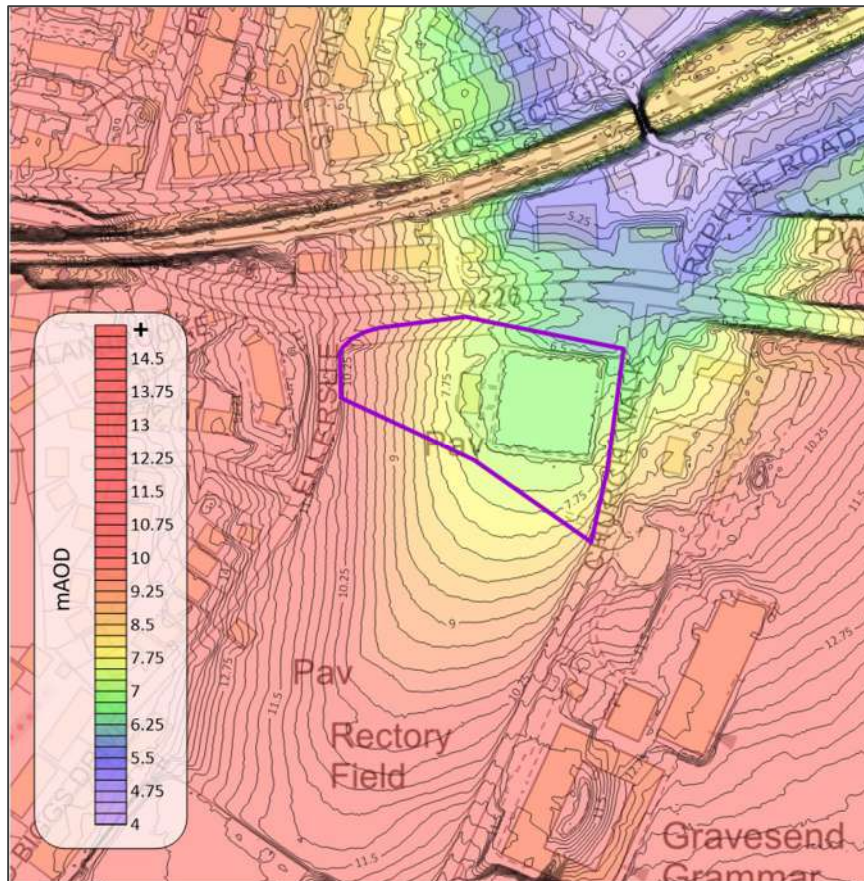


Figure 2.3 - Local contours

(Source: TQ67se_DTM_1m.tif)

2.2 Proposed

- 2.2.1 The proposed development is shown on the drawings in Appendix C and comprises the construction of a multi storey, multi-unit retirement living apartment building with associated car parking provision.
- 2.2.2 Proposed levels are shown on Infrastructure Design Ltd drawing in Appendix E. The proposed minimum floor level is 8.05 mAOD.
- 2.2.3 Current best practice indicates that the design life of a residential development should be 100 years. The year 2122 is therefore considered appropriate in assessing the possible impacts of climate change upon flood risk.
- 2.2.4 The proposed site use is classified as *more vulnerable* in accordance with National Planning Policy Framework (NPPF, 2021) Annex 3. The site is fully within flood zone 1*. An extract from Table 2 of the Planning Practice Guidance (Paragraph: 079 Reference ID: 7-079-20220825) is given below. The red circle indicates the appropriate nature of the site's development's classification.

*See Appendix D (For flood zone information, refer to section 3.1.)

Table 2: Flood risk vulnerability and flood zone 'incompatibility'					
Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	X	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	X	X	X	X *
Key:					
✓ Exception test is not required					
X Development should not be permitted					

3 Flood Zones

- 3.1 As shown in Figure 3.1, the site lies fully within flood zone 1*, the area at low risk of flooding from rivers and the sea. The flood zones represent the fully undefended scenario.

*Refer to Appendix D.



Figure 3.1 - Flood Zones

(Source: <https://flood-map-for-planning.service.gov.uk/>, downloaded 14 October 2022)

- 3.2 Defended flood zone 3 is located approximately 50 m north of the site. Figure 3.2 shows the approximate ground level of 5.5 mAOD at the edge of flood zone 2. In order to consider the possible effects of future climate change added to this tide level, in a residual event that defences fail, tidal flooding should not reach the site because the minimum proposed ground level is c 7.5 mAOD, i.e. 2 m above the ground at the edge of flood zone 2.

Note: the tidal flood level data was requested from the Environment Agency on 16 August 2022, but not yet received. Although the above clearly illustrates that the site should remain within flood zone 1 in the future.

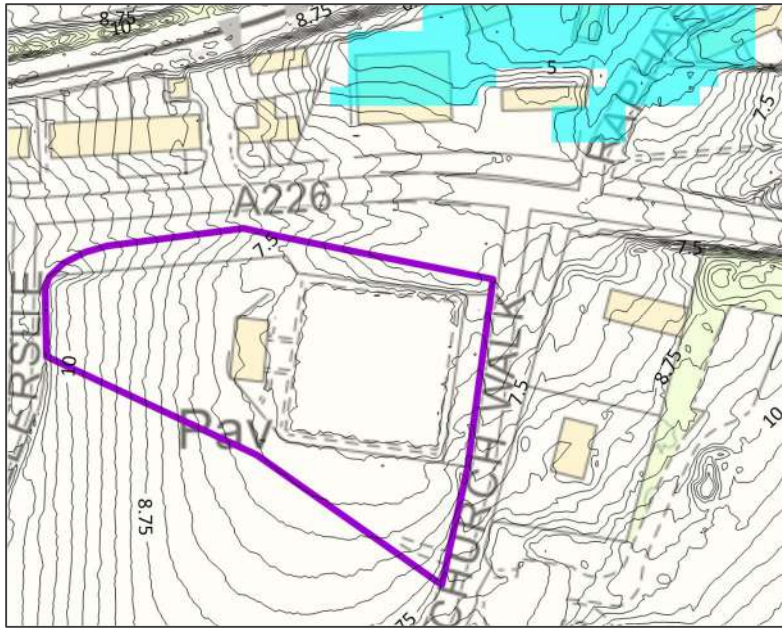


Figure 3.2 - Flood Zone 2

(Source: TQ67se_DTM_1m.tif & Flood_Map_for_Planning_Rivers_and_Sea_Flood_Zone_2.shp)

4 Surface Water Flooding

4.1 National Mapping

4.1.1 Figure 4.1 shows the national Risk of Flooding from Surface Water mapping.

4.1.2 The flood extents on Figure 4.1 may be approximate only since the modelling that derived this mapping would not have included the beneficial conveyance function provided by small drainage systems. The Risk of Flooding from Surface Water mapping is accompanied by the statement that it: *'should not be taken as definitive mapping of flood risk from these as the conveyance effect of ordinary watercourses or drainage channels is not explicitly modelled. Also, structures (such as bridges, culverts and weirs) and flood risk management infrastructure (such as defences) are not represented.'* So the exact beneficial conveyance effects of the local surface water drainage systems are not accounted for in the modelling. The mapping also does not take into account the complexities of the urban landscape, e.g. kerbs, walls and other features that will act to affect the flow routes.



Figure 4.1 – Risk of flooding from surface water - at site

(Source: RoFW_TQ67_Extent_1in1000.shp, RoFW_TQ67_Extent_1in100.shp, RoFW_TQ67_Extent_1in30.shp, downloaded 22 August 2022)

4.2 Catchment Information

4.2.1 The following paragraphs provide a review of flood mapping in Figure 4.1.

4.2.2 The Thameside Surface Water Management Plan, Appendix B.2 includes the following records of past flooding in the local area, but nothing on the site. These are all areas shown to be at high risk of flooding on Figure 4.2.

G: Milton	Heavy rainfall resulting in run off from overloaded / blocked drains, overloaded sewers or overland flow	Southern Water sewers Surface water flow along Norfolk Road and large areas of ponding in this location Surface water flow along Raphael Road in a north east direction Gullies and drains	FMISW 1 in 200 yr (deep) Historic evidence of surface water run off flooding the carriageway. There is also evidence to support flooding as a result of overloaded sewers and blocked drains/ gullies.
F: Gravesend East	Heavy rainfall resulting in run off from overloaded / blocked drains, overloaded sewers or run off	Ponding along Milton Hall Road, Parrock Avenue and Pine Avenue Southern Water sewers Gullies and drains	Historic evidence of blocked drains causing a number of properties to flood FMISW 1 in 200 yr (deep) There are records of hydraulic overload from sewers causing flooding

4.2.3 There is a channel drain across the north of Church Walk at its junction with Milton Road. This indicates that there may have been past surface water issues in the highway north east for the site. This has been confirmed by comments made by Kent County Council Lead Local Flood Authority (LLFA). We also understand that the soakaways shown in the road verge immediately north of the site, have been constructed to alleviate highway surface water issues. These are shown on the services survey in Appendix E.

4.2.4 Figure 4.3* shows the topographical catchment to the flood flow path shown on the above mapping. The blue shaded catchment is 51 ha.

*Figure 4.3 shows the likely extent of the topographical catchments near to the site. The outline of topographical sub-catchments are in black, and theoretical flow paths are blue lines. These are theoretical only and do not include the effects of drainage systems or localised topographical features (kerbs, buildings, pipes, small watercourses etc.) The width/location of the flow paths will vary. In reality the catchment is urban and there will be drainage systems to convey runoff that are not represented in the mapping.

4.2.5 The three upstream areas indicated in yellow on Figure 4.2 are shown as routes for flood water to pass into the fields and eventually on to the site. It was very evident from our site visit that overland flow is unlikely to pass from these residential areas through to the fields due to brick walls, as shown in Photographs 4.1, 4.2 and 4.3. These significant obstructions to surface water flow would not have been included in the flood modelling which the flood map is based upon.

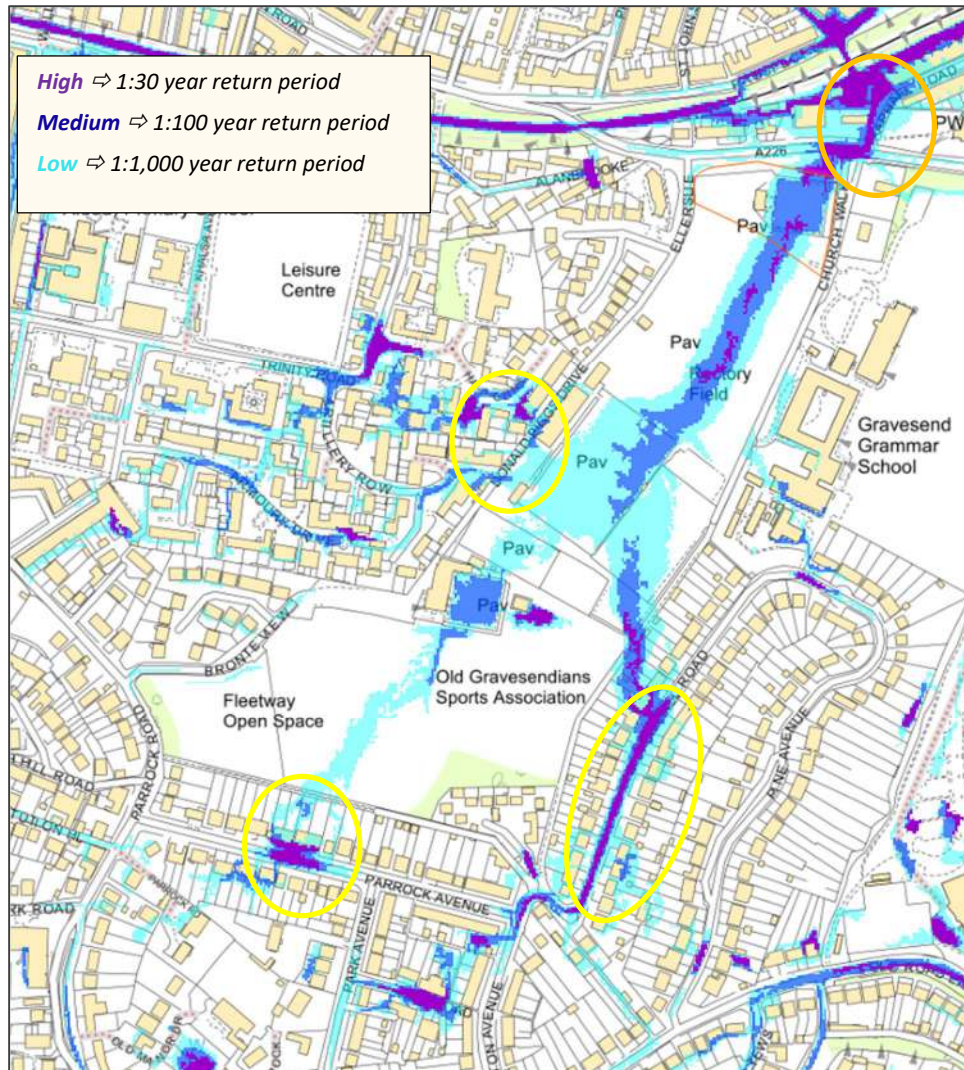


Figure 4.2 – Risk of flooding from surface water

(Source: RoFW_TQ67_Extent_1in1000.shp, RoFW_TQ67_Extent_1in100.shp, RoFW_TQ67_Extent_1in30.shp, downloaded 22 August 2022)



Photograph 4.1 - Wall along east of Donald Riggs Drive



Photograph 4.2 - Wall at the north boundary of properties along Parrock Avenue



Photograph 4.2 - Wall at the east boundary of properties along Milton Hall Road

One property had a close boarded fence instead of wall, but mainly brick walls)

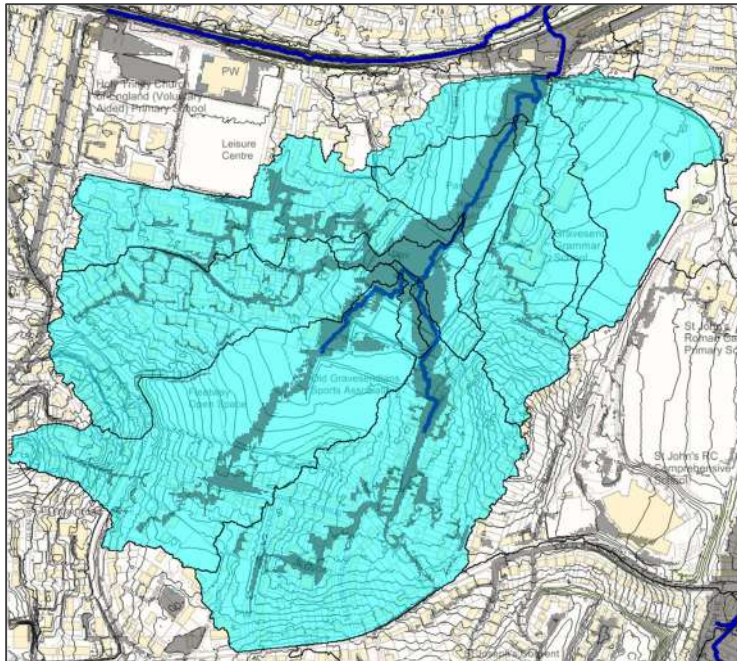


Figure 4.3 – Watersheds

(Source: TQ67se_DTM_1m.tif) Contours shown at 0.25 m centres

Blue shading: watersheds

Grey shading: Low [risk](#)/1:1,000 year return period surface water flood extent

- 4.2.6 A desk study (OS and historic mapping) has resulted in no evidence of watercourses (piped or open) throughout the catchment. The LLFA has concurred with this via their own research too.
- 4.2.7 Our web site search for information on flooding near to or in the fields uphill of the site has not resulted in any records of waterlogging or flooding. The flood mapping indicates that there's no notable high risk of flooding at the site and in the fields to the north.
- 4.2.8 The public sewer mapping in the catchment is given in Appendix F and shows mainly combined sewers. There are also many areas where only foul water sewers are shown. We understand that there may be infiltration drainage in the catchment too given the permeable chalk soil. We do not know where or how widespread these are though.
- 4.2.9 The British Geological Survey Geoindex database shows limited information in the topographical catchment on superficial deposits. Where mapping is available it suggests Head deposits: clay, silt, sand. The bedrock seems to vary from sand to chalk.

4.3 Flood Risks at Site

- 4.3.1 An indication of possible peak flood depths is given by the mapping presented in Figures 4.4 and 4.5. The 1:100 year mapping shows shallow overland flow of < 0.15 m, only slightly deeper at the existing bowling green which is level. We note that the deeper flooding annotated at the north of Raphael Road is due to ground levels falling towards the raised railway embankment. There is a pedestrian footway through a culvert that would enable a flow to pass to north of the railway line.
- 4.3.2 Planning policy, and associated guidance, requires consideration of the 1:100 year plus climate change surface water flood (the 'design' flood, ref: Paragraph: 002 Reference ID: 7-002-20220825). Currently, there is no national surface water flood mapping that includes climate change so as a precautionary approach we refer to the 1:1,000 year (low risk) mapping.

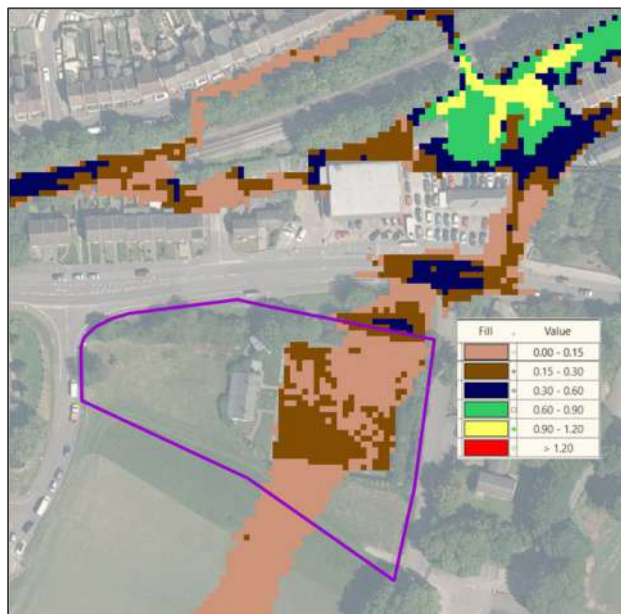


Figure 4.4 – Risk of flooding from surface water – 1:100 – peak depth (m)

(Source: RoFW_TQ67_Extent_1in100.shp)

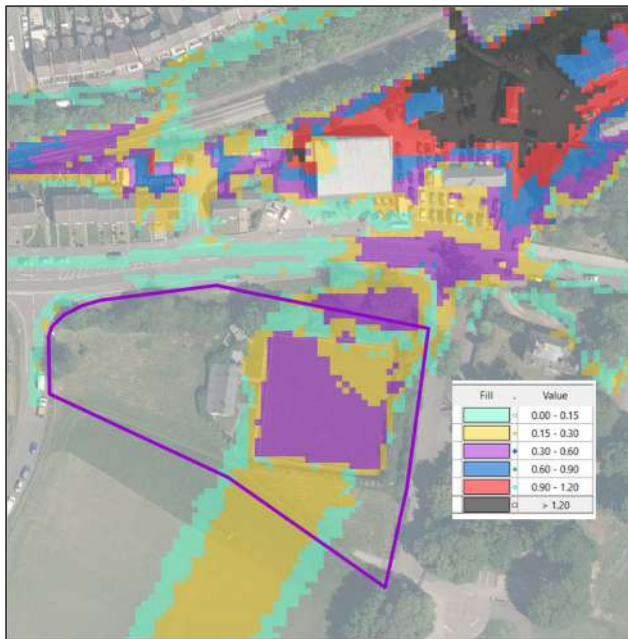


Figure 4.5 – Risk of flooding from surface water – 1:1,000 – peak depth (m)

(Source: RoFW_TQ67_Extent_1in1000.shp)

- 4.3.3 Although we have found no evidence that flooding may occur as illustrated by the flood mapping, we need to consider the extreme possibility that it could occur. If overland flow does approach the site from the south the proposed development will convey flow through the site to the north boundary where it may continue downstream as per the existing regime.
- 4.3.4 A very significant portion of the catchment upstream is urbanised and there is a large trunk combined sewer which will intercept and convey a significant portion of the upstream flow, conveying it underground through the site. The conveyance benefit of this sewer is not included in the overland flood flow mapping. Along with the lack of evidence for flooding at the site and along the flow route upstream, we conclude that the surface water flood mapping is probably an overestimate of likely flood extents.
- 4.3.5 In order to review flow areas, the approaching flow width is a maximum of c 40 m. The flow depth is an average of c 0.15 m: 40 m flow width x 0.15 m deep = 6 m² flow area.

4.4 Flood Mitigation

- 4.4.1 The proposed development has been designed with flow paths to route the possible flood flow from the south through the site and re-entering the floodplain downstream, at the site's north boundary. Figure 4.6 shows shaded in purple where proposed ground levels

have been kept low to enable flood water to pass onto the site, and conveyed around the east and west of the proposed building, and back onto the floodplain downstream.



Figure 4.6 - Flood paths on site

4.4.2 The ground levels have been set at 7.6 mAOD or lower in this area:

West: To the west corner of the building (circled in orange) there is a pinch point shown in section in Figure 4.7

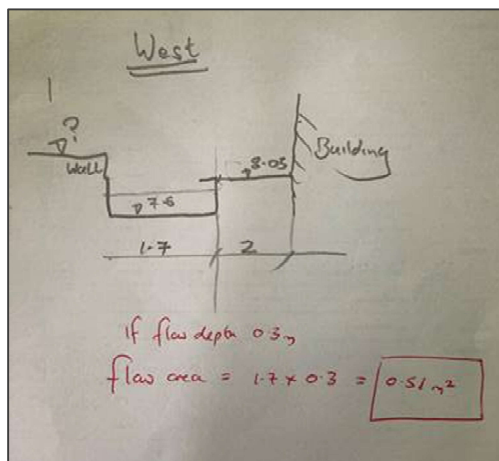


Figure 4.7 - West pinch point

East: The ground at the south east of the proposed building (circled green) has been opened up and a swale will intercept and convey flow. The swale has been designed to intercept flow along the south boundary of the site and it will convey overland flow from the fields to the south in more frequent runoff events than those indicated in Figures 4.4 and 4.5. Figure 4.8 shows the cross section of the eastern flow path.

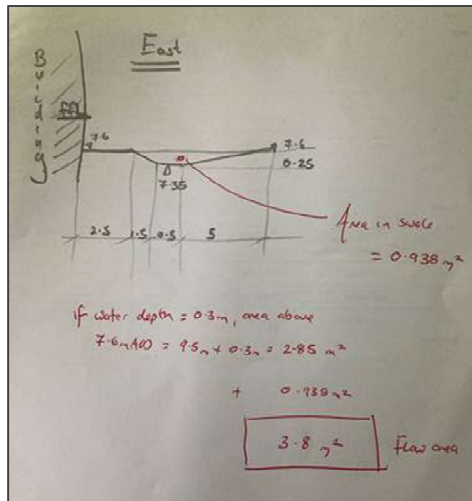


Figure 4.7 - East pinch point

4.4.3 Figures 4.6 and 4.7 indicate how the flow path cross sectional area may be a minimum of 4.3 m^2 at its narrowest locations, with a water depth of 0.3 m . If the flow depth were to rise to 0.45 m (8.05 mAO), the minimum flow area would increase to 6 m^2 , equivalent to the existing approaching flow path.

4.4.4 The flow capacity of the site not only relates to the flow area though. The gradient of the flow path would also dictate the capacity of the site. Figure 4.8 shows how the proposed flow route around the east of the building will have a gradual gradient to the north.

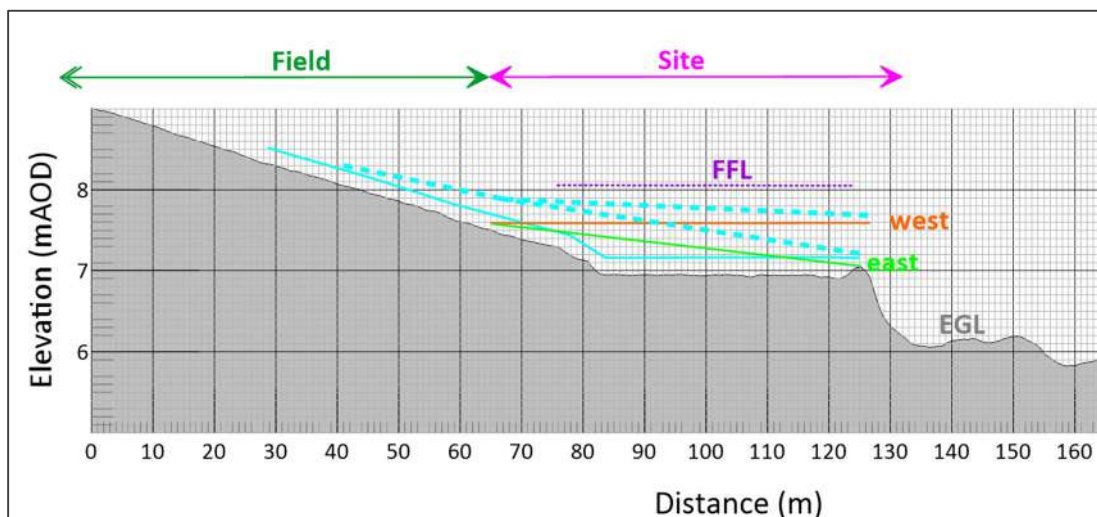


Figure 4.8 - Long section A-A

Refer to Figure 4.8 for location of existing long section

Purple = finished floor level

Orange = ground levels around west of building

Green = approximate ground levels round east of building

Solid blue line = approximate existing peak depth (indicative only)

Dashed blue lines = estimated proposed hydraulic head (indicative only)

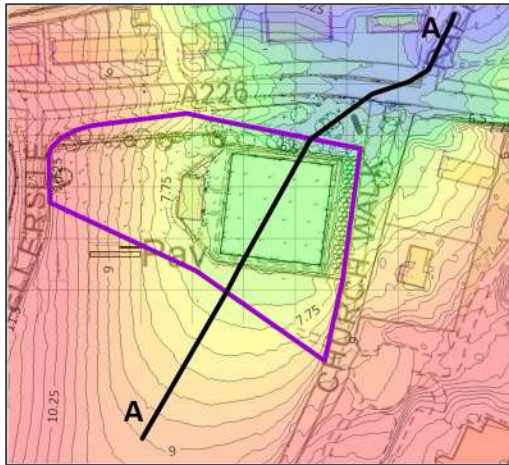


Figure 4.9 – Long section location (existing)

- 4.4.5 The ground level of Church Walk to the east of the site varies. At the south of the site's east boundary it is well above the level of the site and the proposed building floor level. Near the north site boundary Church Walk drops to below the site. Figure 4.10 shows the location of a proposed wall that will have crest level of 8.1 mAOD. This will ensure that where the road falls below the possible flow path on site, water will be prevented from passing onto Church Walk.

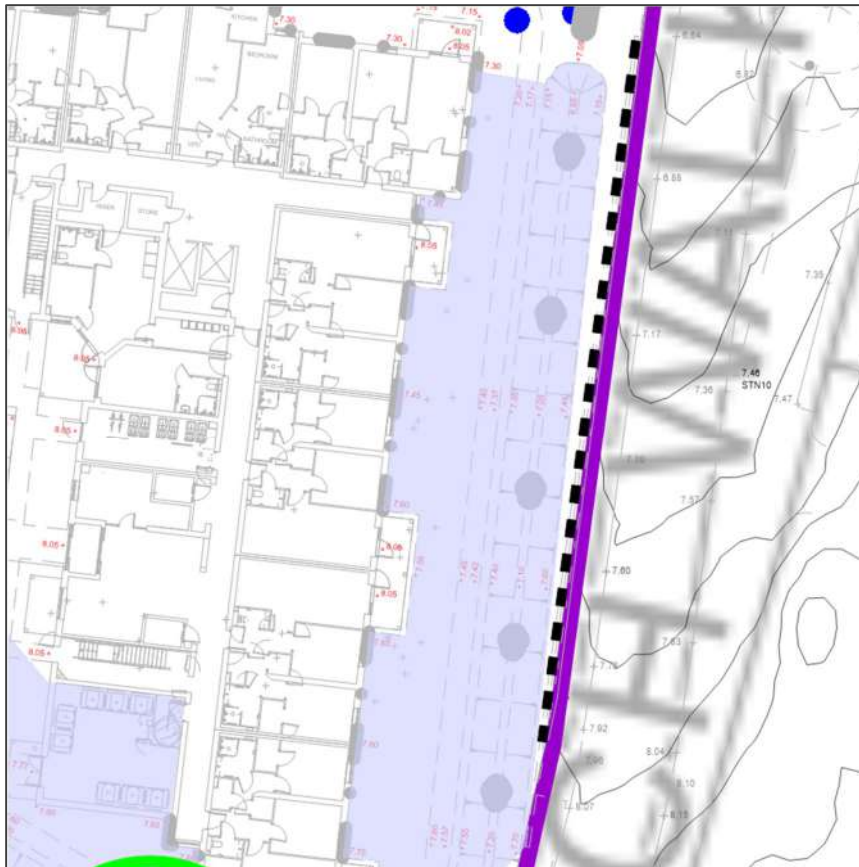


Figure 4.9 – Proposed wall

- 4.4.5 There is a large diameter combined public sewer passing through the site. IF flooding occurred from this sewer at manhole 0814 the contours imply flow would pass north of the site along Milton Road. If flooding occurred from manhole 7701 or 7702 then there is a risk of flooding on site. But the flood mitigation measures referred to above will also enable management of this flooding keeping it away from the building.



- 4.4.6 The flood data used in this report is currently the best available for this site. Flood defences or other changes to possible flow regimes could occur in the future to increase or decrease the risk of flooding at the site. Or revised predictions could become available due to changes in modelling methodologies. Flood levels stated in the report are also at the very peak of the modelled flood event/s. In reality the flood levels will rise and fall over the duration of the given flood event.

4.5 Flood Management

- 4.5.1 If flooding were to occur at the site it is expected only very rarely in extreme weather events. This type of surface water flooding may occur from heavy rainfall which is not wholly predictable and it is very unlikely that flood warnings will be available in advance. The site owners and management staff should receive weather warnings which could indicate possible forecasts for heavy rain.
- 4.5.2 If flooding were to occur it is not expected to last for long durations, or remain on site since the proposed site levels and drainage systems can convey flow off site.
- 4.5.3 If there are ever occasions over the lifetime of the development that flooding occurs, it could disrupt access to the building. In which case the occupants should adopt a stay put policy and seek refuge in the building until flood water recedes.

- 4.5.4 All site owners/occupiers should be aware of the possible flood risks. They should prepare a flood management plan. This will need to clearly stipulate what actions to take in advance of flooding and when flooding nearby is imminent.
- 4.5.5 It is not safe to enter floodwater (walk, swim, cycle or drive etc.). It may be fast flowing, contain debris, be contaminated, cold or hide unseen dangers. Therefore, evacuation should be undertaken in advance of flood water reaching the vicinity of the site and the access routes, and always in accordance with the instructions of the emergency authorities.

5 Groundwater Flooding

- 5.1 Figure 5.1 shows the Geosmart GW5 (v2.1) groundwater flood risk mapping which confirms that the site is in CLASS 4: NEGLIGIBLE RISK: *There is a negligible risk of groundwater flooding in this area and any groundwater flooding incidence has a chance of less than 1% annual probability of occurrence.*

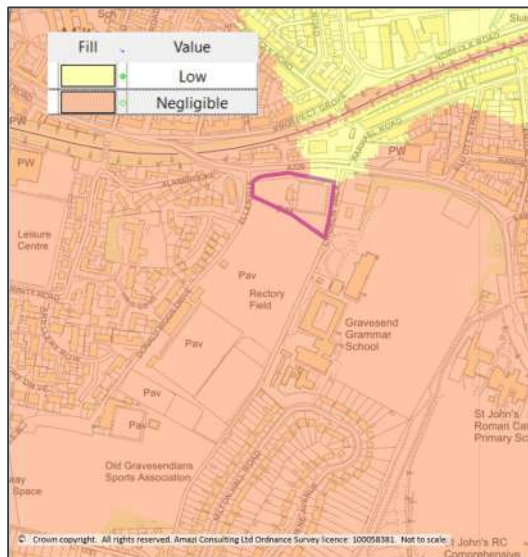


Figure 5.1 – Groundwater flood risk

(Source: GW5 v2.1)

6 Summary

- 6.1 The proposed development comprises construction of a multi-unit retirement living apartment building with associated car parking provision.
- 6.2 The site lies fully within flood zone 1, the area at low risk of flooding from significant watercourses or the sea.
- 6.3 The risk of flooding from surface water mapping shows a flow path through the site from south to north. If surface water flooding were to occur from the field to the south there is a proposed flow path (including a swale) through the development site and a proposed finished floor level raised to 8.05 mAOD, 450 mm above proposed surrounding ground levels. A small wall is proposed along part of the site's east boundary to contain flood flows on the site and re-directing to the original floodplain location at the site's north boundary.

A
Location

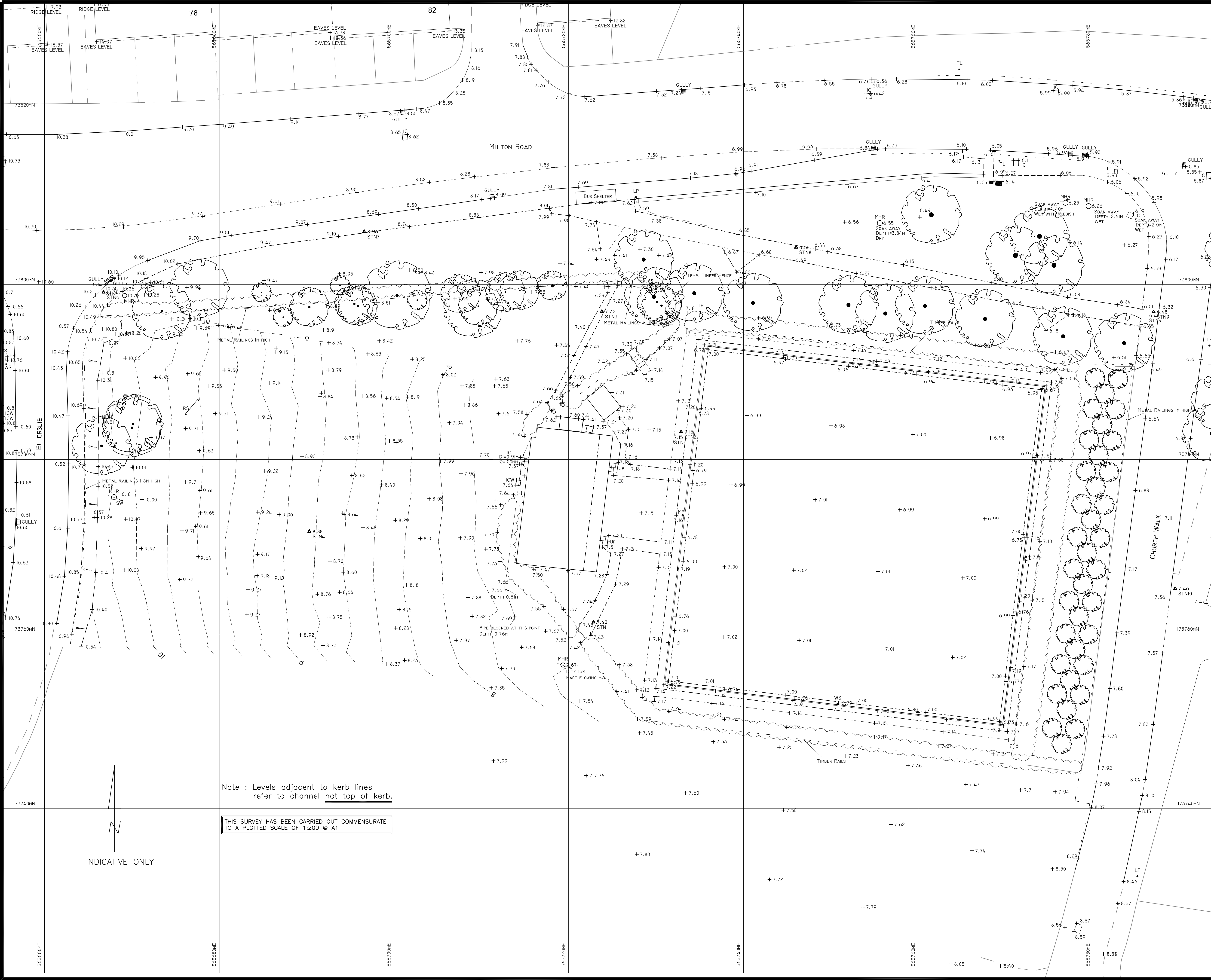
Gravesend RFC Bowls Club, corner of Milton Road and Ellersie, Gravesend,
Kent DA12 2QU



Gravesend RFC Bowls Club, corner of Milton Road and Ellerslie, Gravesend,
Kent DA12 2QU



B
Survey



DRG NO: PP/4081/GRAVESEND/FI

LEGEND

- A AREA
- CATV CABLE TV SERVICE COVER
- CF CELLAR FLAP
- CP COAL PLATE
- E ELECTRICITY SUPPLY
- FH FIRE HYDRANT
- IC INSPECTION CHAMBER
- KL LOWERED KERB FOR ACCESS
- LP LAMP POST
- MH MANHOLE
- NP ROAD NAME PLATE
- PL PAVEMENT LIGHT
- RS ROAD SIGN
- STN SURVEY STATION
- T BT SERVICE BOX
- TGB TELEPHONE CALL BOX
- TL TRAFFIC LIGHTS
- TP TELEGRAPH POLE
- UP STEP ARROW
- DN RAMP ARROW
- (D) DEAD OR (P) POLLARDED TREE
- DECIDUOUS TREE (INDIVIDUALLY SHOWN)
- EVERGREEN TREE (INDIVIDUALLY SHOWN)
- TREES (DECIDUOUS) - PART OF A GROUP OF TREES

4081-Gravesend-F1.dwg

STATION CO-ORDINATES

STATION	TYPE	EASTING	NORTHING	LEVEL
STN5	NAIL	565655.698	173760.255	10.949
STN6	NAIL	565666.769	173799.143	10.354
STN7	NAIL	565696.588	173806.082	8.956
STN8	NAIL	565746.023	173804.283	6.510
STN9	NAIL	565786.941	173796.899	6.475
STN10	NAIL	565789.405	173765.214	7.463

COORDINATE INFORMATION:
ALL LEVELS IN METRES TO ORDNANCE SURVEY
DATUM AND BASED ON NATIONAL GRID FROM RTK GPS
AND ADJUSTED INTO OS ACTIVE NETWORK

B	ADDITIONAL LEVELS ADDED AND MANHOLE IN CHURCH WALK LOCATED	RW	17-05-22
A	LEVEL TYPE CORRECTED ALONG ELLERSLIE RD. COVERS INVESTIGATED & TRACED.	RW	11-04-22
REV	DRG. AMENDMENTS	BY	DATE

MCCARTHY & STONE

85 GREAT NORTH ROAD
HATFIELD
HERTS AL9 5DA

GRAVESEND RFC BOWLS CLUB

GRAVESEND
KENT DA12 2TL

TOPOGRAPHICAL SURVEY

PROSPAPLANS LIMITED

LAND & ENGINEERING SURVEYORS
O'HANA HOUSE
BEETLEY
NORFOLK
NR20 4FE

T: +44 (0) 1362 668504
E: INFO@PROSPAPLANS.COM
W: WWW.PROSPAPLANS.COM

Operating to ISO9001:2000

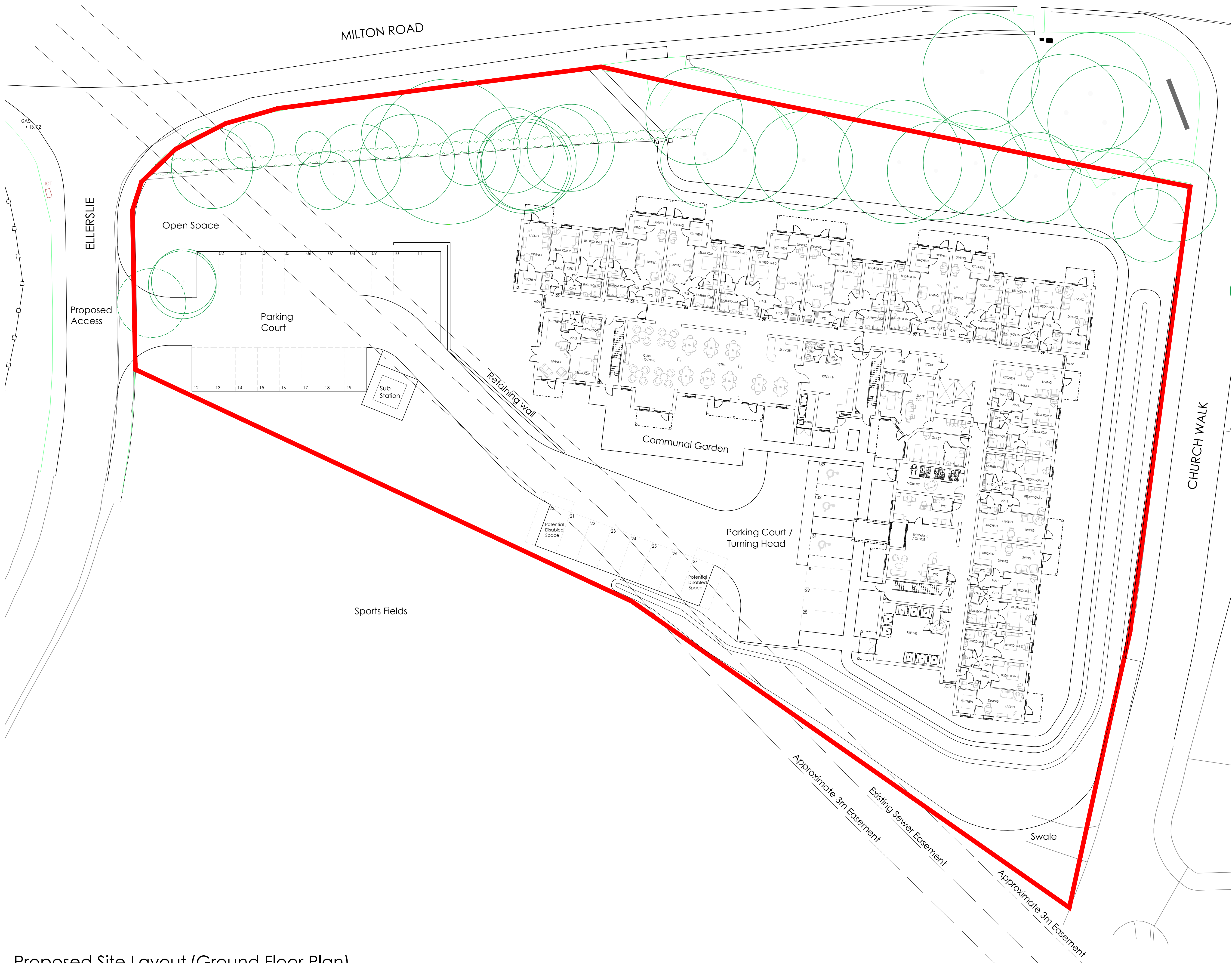
SCALE: 1:200@A1

DATE: DEC 2021

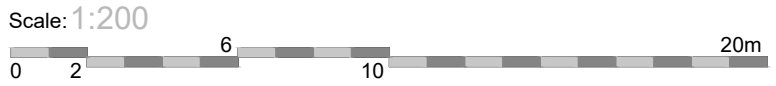
DRAWN BY:	CHECKED BY:
R WELTON	G RUTHERFORD

DRG NO: PP/4081/GRAVESEND/FI

C
Proposed Site



This drawing and the design are the copyright of **ON Architecture Ltd** only.
This drawing should not be copied or reproduced without written consent.
All dimensions are to be checked on site prior to setting out and fabrication and **ON Architecture Ltd** should be notified of any discrepancy prior to proceeding further.
For Construction & Fabrication Purposes - Do not scale from this drawing, use only the illustrated dimensions herein. Additional dimensions are to be requested and checked directly.
Illustrated information from 3rd party consultants/specialists is shown as indicatively only. See other consultant / specialist drawings for full information and detail.



NOTE: Site boundary to be confirmed

Revision Note & Date			Initial
Rev.	Date	Note	
P1	23-08-2022	Minor amendments following fire consultant comments.	PTW
P2	14-09-2022	Minor amendments following client comments.	PTW
P3	30-09-2022	Minor amendments following drainage engineers comments.	DK
P4	04-10-2022	Minor amendments following tracing.	GA
P5	14-10-2022	Minor amendments following client comments.	KY
P6	23-10-2022	Minor amendments following updated drainage strategy.	KY
P7	02-11-2022	Minor amendment to parking.	PTW

ON ARCHITECTURE

Canterbury Studio
Lagon House, St Andrews Close
Canterbury,
CT1 2RP

info@onarchitecture.co.uk
onarchitecture.co.uk
01227 634334

Project Title
**Proposed Retirement Living Plus Development
Bowls Club, Gravesend**

Client Details
McCarthy Stone

Drawing Title
**Proposed Site Layout
(Ground Floor Plan)**

BIM Number

Scale	Date	Drawn	Checked
1:200@A1	August 2022	GA	DK

Drawing Status
PINK FILE

Project Number	Drawing Number	Drawing Revision
LSE-2821-03-AC-0010		P7

Proposed Site Layout (Ground Floor Plan)
Scale 1:200 @ A1

D

NPPF Planning Practice Guidance Flood Risk and Coastal Change, Table 1

National Planning Policy Planning Practice Guidance: *flood risk and coastal change*

Table 1: Flood Zones

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 0.1% annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map for Planning – all land outside Zones 2, 3a and 3b)
Zone 2 Medium Probability	Land having between a 1% and 0.1% annual probability of river flooding; or land having between a 0.5% and 0.1% annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1% or greater annual probability of river flooding; or Land having a 0.5% or greater annual probability of sea. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise: • land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or • land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding). Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

Note: The Flood Zones shown on the Environment Agency's Flood Map for Planning (Rivers and Sea) do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding. Reference should therefore also be made to the [Strategic Flood Risk Assessment](#) when considering location and potential future flood risks to developments and land uses.

Paragraph: 078 Reference ID: 7-078-20220825

E
Services Survey



Note.	Date	By
Original Issue	11/2/2022	PL

position of the utility shown is to be taken as center line of the utility and not the scaled size of the utility.

The background information used for the utility identification survey was by McCarthy & Stone Ltd.

This drawing should be read in conjunction with the current utility provider's maps.

The majority of the gas and water mains shown were polyethylene and their positions are shown approximately.

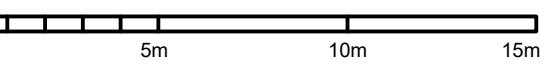
The accuracy of the digital data is the same as the plotting scale implies. Dimensions are in metres unless otherwise stated.

Lighthouse Surveys Limited hold the copyright to all the information recorded within this document and their written consent must be obtained before copying or using the data other than for the purpose it was originally intended for.

NOTE: Do not scale from this drawing, work to figured dimensions.

AREA OF SURVEY	
AREA UNABLE TO SURVEY	
SCAFFOLD SCAR	
DEPTH BELOW SURFACE	-0.40d (m)
METER OF PIPE	Ø100mm
STANDARD ROUTE	xx-AR
RM RECORD	xx-R
END OF TRACE	EoT
END	±
CONNECTION POINT	
CT	
UTILITY REMOVED ON SITE	
VOLTAGE ELECTRIC	EHV
H VOLTAGE ELECTRIC	HV
L V VOLTAGE ELECTRIC	LV
LIGHT LIGHTING	SL
ELECTRIC CONTROL	GC
G	G
GAS	PG
GAS	MPG
GAS	HPG
WATER	W
FISH TELECOM	BT
GIN MEDIA	VM
NUCLEAR	GC
DEFONE	VF
TEL TELECOMS	CT
ENSED CIRCUIT TV	CCTV
ALOGUE TV	ATV
EL PIPELINE	C
PIPELINE	C
FACE WATER DRAINAGE	SD
EDRAIN DRAINAGE	PD
MINED WATER DRAINAGE	CD
EDRAIN WATER DRAINAGE	PD
UNKNOWN UTILITY	U
ATING PIPES	HTG

 Lightsource Surveys Ltd
Technical Surveying Specialists.
50 Magnolia Way, Pilgrims Hatch,
Brentwood, Essex CM15 9QU
M: 07731 549382 E: info@lightsourcesurveys.com



Project Title	Retirement Living
Client	FC Bowls Club
Location	Church Walk
Postcode	Gravesend Kent DA12 2TL

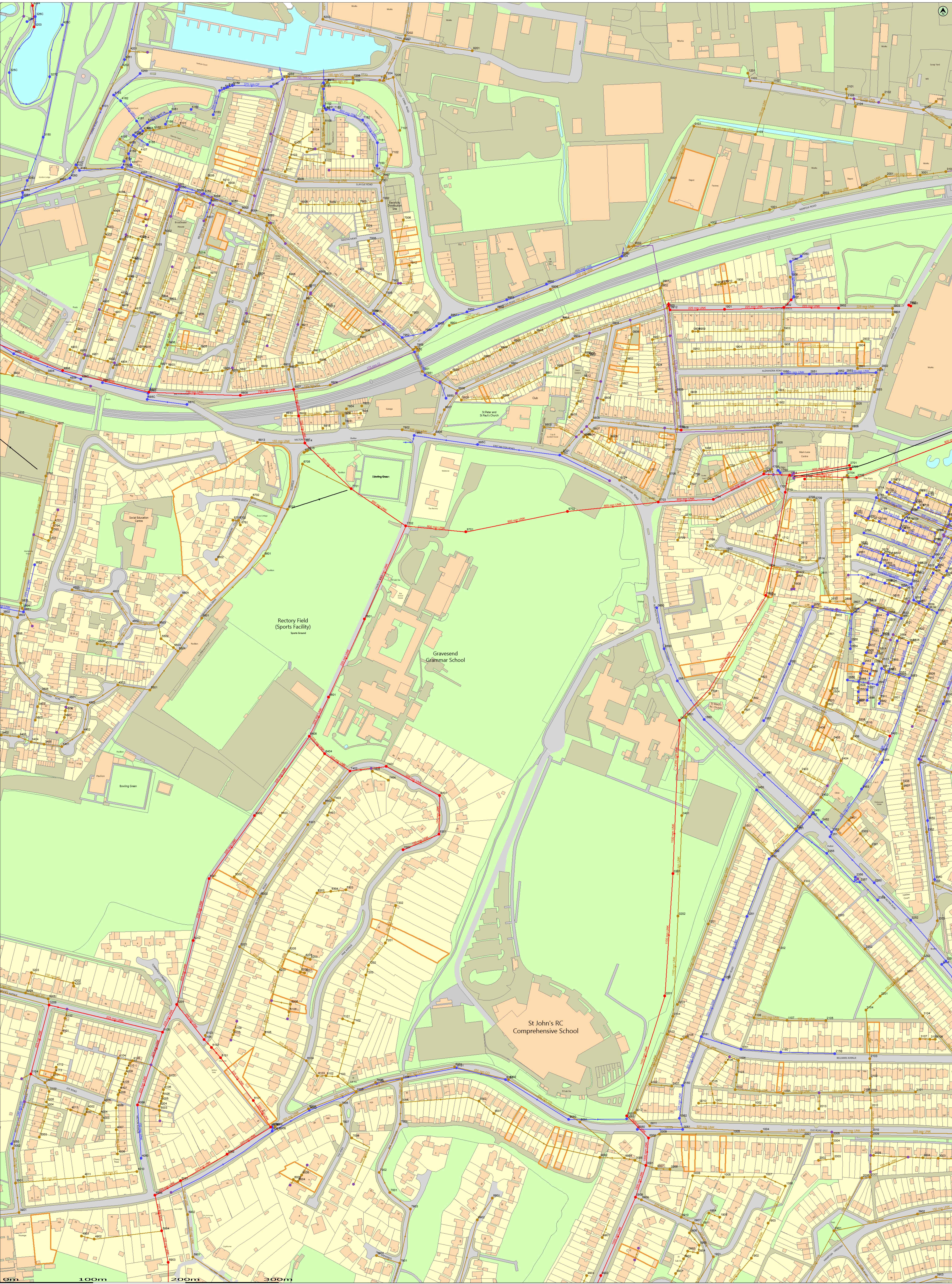
Drawing Title
UTILITY IDENTIFICATION SURVEY

Date 1:200 @ A0 Date 11.2.2022
 Item PL Checked PS
 Ref No.
 SE-2821-0-US-0000 A
 Page No. Page No. Page No. Page No. Page No.

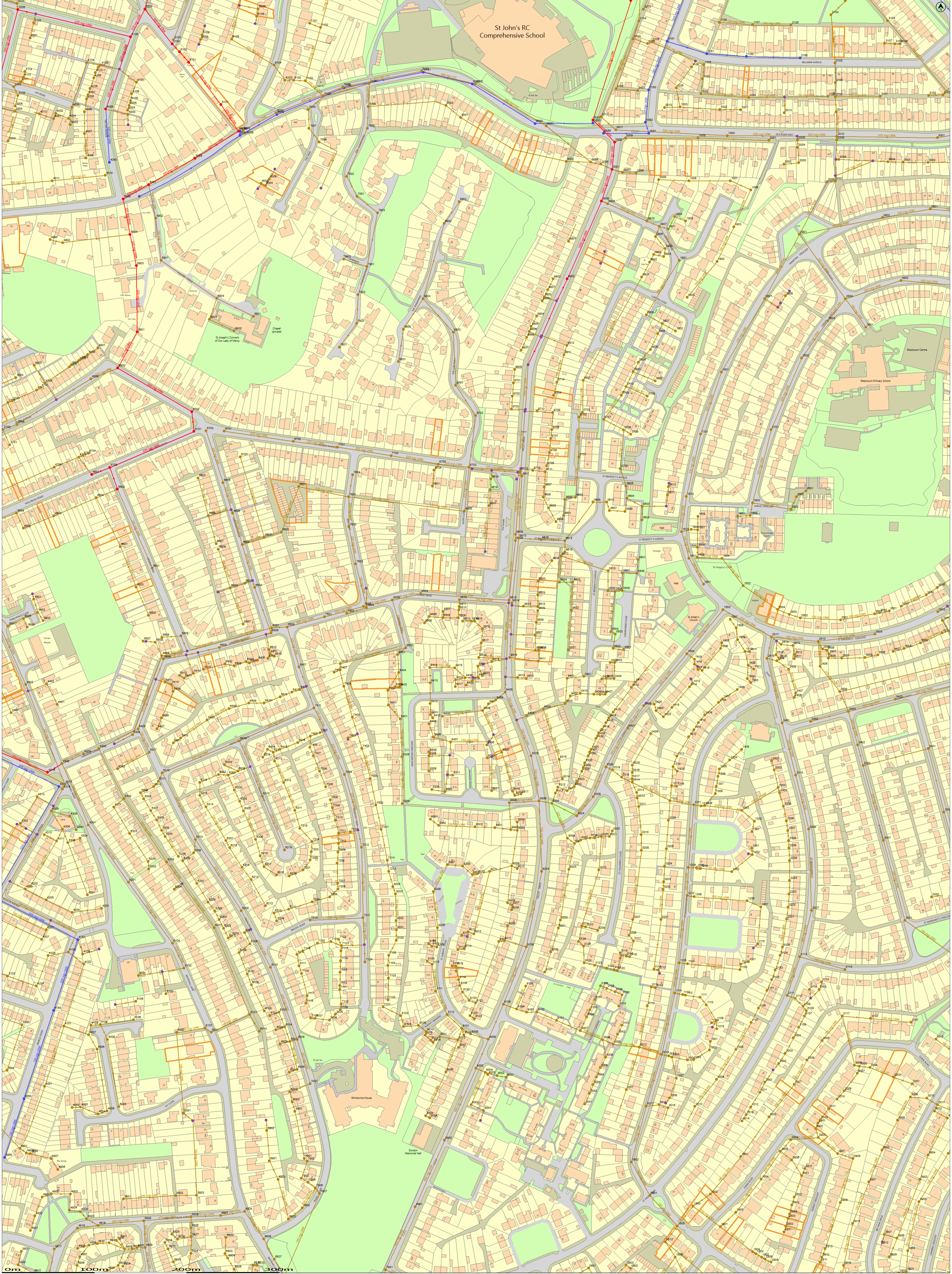
© McCarthy & Stone Retirement Lifestyles Limited
All rights reserved. The reproduction of all or any part of this drawing/document and/or construction of any building or part of a building or structure to which this drawing/document relates without the written permission of the copyright owner is prohibited.

F

Southern Water Mapping



Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert	Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert	Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert	Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert	Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
0001	C	10.36	0.00		2103	F	0.00	2.87		4105	F	23.01	22.09		7203	F	0.00	0.00		4152	S	0.00	0.00	
0002	C	10.75	6.72		2104	F	11.33	0.00		4106	F	6.47	5.36		7204	F	4.58	0.00		4153	S	5.51	0.00	
0003	C	0.00	0.00		2104	F	0.00	3.07		4106	F	24.72	23.15		7204	F	4.89	1.18		4154	S	7.25	5.88	
0201	C	9.97	6.17		2105	F	9.56	8.25		4106	F	6.63	5.42		7205	F	4.95	1.85		4156	S	6.63	4.98	
0301	C	10.08	5.98		2106	F	12.69	11.49		4107	F	24.18	0.00		7206	F	0.00	0.00		4157	S	7.20	5.96	
0502	C	10.57	5.07		2201	F	11.23	0.00		4107	F	6.89	5.63		7302	F	30.05	29.60		4158	S	6.91	5.17	
0703	C	12.75	4.89		2202	F	0.00	0.00		4108	F	24.02	0.00		7303	F	29.01	27.60		4159	S	6.63	5.06	
0808	C	9.38	0.00		2203	F	5.78	4.57		4109	F	23.31	22.47		7403	F	22.60	21.97		4160	S	6.56	4.72	
0909	C	10.54	0.00		2301	F	4.89	0.00		4110	F	23.31	0.00		7404	F	0.00	0.00		4161	S	6.72	4.65	
0912	C	0.00	0.00		2302	F	4.48	0.00		4111	F	23.36	0.00		7405	F	0.00	0.00		4162	S	7.00	4.56	
1605	C	0.00	0.00		2303	F	0.00	0.00		4112	F	25.87	25.05		7801	F	4.17	0.00		4251	S	0.00	0.00	
1704	C	10.41	0.00		2401	F	0.00	0.00		4113	F	25.71	24.94		7802	F	5.96	3.32		4253	S	0.00	0.00	
1705	C	7.46	0.00		2402	F	3.74	2.34		4201	F	28.02	27.63		7803	F	6.64	0.00		425C	S	0.00	0.00	
1713	C	0.00	0.00		2403	F	0.00	0.00		4201	F	0.00	0.00		7804	F	0.00	0.00		485C	S	0.00	0.00	
1715	C	0.00	0.00		2404	F	0.00	0.00		4202	F	27.95	27.13		7805	F	7.08	6.46		486C	S	0.00	0.00	
1901	C	3.52	0.00		2405	F	0.00	0.00		4202	F	0.00	0.00		7806	F	0.00	0.00		5050	S	0.00	0.00	
1902	C	3.24	0.00		2406	F	3.40	1.90		4401	F	0.00	0.00		7807	F	7.93	0.00		5052	S	0.00	0.00	
1907	C	3.13	1.04		2407	F	4.06	3.21		4402	F	0.00	0.00		7901	F	0.00	31.75		505C	S	0.00	0.00	
2701	C	0.00	0.00		2408	F	3.80	2.61		4501	F	0.00	0.00		7901	F	4.80	3.38		506C	S	0.00	0.00	
2702	C	5.34	5.35		2501	F	4.01	3.02		4502	F	0.00	0.00		7902	F	0.00	32.18		5150	S	6.48	4.21	
2703	C	4.20	0.00		2502	F	3.41	1.79		4503	F	0.00	0.00		7902	F	5.02	2.12		5151	S	6.35	4.25	
2705	C	0.00	0.00		2503	F	3.45	1.74		4504	F	17.40	16.11		7903	F	0.00	30.60		5152	S	6.27	3.85	
2902	C	3.27	1.00		2504	F	3.36	0.00		4505	F	17.30	16.03		7903	F	3.97	3.05		5153	S	5.98	3.82	
3104	C	25.25	22.64		2505	F	3.30	0.00		4506	F	16.84	15.90		7904	F	0.00	0.00		5154	S	5.14	3.67	
3203	C	0.00	0.00		2506	F	3.43	0.00		4507	F	0.00	0.00		7905	F	5.14	2.04		5155	S	7.04	5.14	
3204	C	0.00	0.00		2507	F	0.00	0.00		4508	F	0.00	0.00		7906	F	5.18	1.86		5156	S	6.52	5.45	
3206	C	27.79	0.00		2508	F	3.38	0.00		4600	F	18.37	16.90		7907	F	0.00	0.00		5157	S	5.00	2.84	
3403	C	4.06	3.20		2509	F	3.24	1.70		4601	F	18.58	16.39		7908	F	5.86	0.00		5158	S	4.90	3.11	
3901	C	0.00	0.00		2510	F	3.16	1.94		4602	F	17.05	15.62		7909	F	4.25	0.88		5159	S	4.90	3.54	
3902	C	0.00	0.00		2511	F	3.39	2.10		4701	F	0.00	0.00		7911	F	4.62	1.61		585C	S	0.00	0.00	
4009	C	0.00	0.00		2512	F	3.36	1.64		4801	F	0.00	0.00		7912	F	0.00	0.00		586C	S	0.00	0.00	
4805	C	15.47	5.60		2513	F	3.22	0.00		4802	F	0.00	0.00		8001	F	0.00	0.00		587C	S	0.00	0.00	
5001	C	30.58	0.00		2514	F	3.27	1.70		4803	F	0.00	0.00		8002	F	0.00	0.00		6050	S	0.00	0.00	
5002	C	28.20	23.28		2515	F	3.26	1.37		4804	F	0.00	0.00		8101	F	22.59	14.36		6051	S	0.00	0.00	
5101	C	22.77	20.59		2516	F	0.00	0.00		4806	F	15.65	13.74		8102	F	19.83	12.51		6052	S	0.00	0.00	
5102	C	22.53	20.48		2601	F	3.62	2.06		4807	F	17.50	14.94		8201	F	4.49	2.79		6150	S	4.72	2.47	
5104	C	21.87	20.35		2602	F	3.57	1.86		4901	F	0.00	0.00		8801	F	5.62	0.00		6151	S	4.80	2.76	
5108	C	22.52	0.00		2603	F	3.13	0.00		4901	F	0.00	0.00		8802	F	4.45	3.27		6152	S	4.82	2.67	
5201	C	22.21	19.89		2604	F	3.06	2.04		4902	F	0.00	0.00		8803	F	4.45	2.82		6153	S	4.76	2.35	
5202	C	22.40	19.33		2605	F	3.21	1.91		4902	F	0.00	0.00		8804	F	6.03	4.40		6154	S	4.81	2.30	
5301	C	21.54	18.86		2606	F	3.32	0.00		4903	F	0.00	0.00		8805	F	0.00	0.00		6250	S	4.70	2.42	
5802	C	14.69	5.57		2607	F	3.34	0.00		4904	F	0.00	0.00		8806	F	5.94	3.06		7150	S	4.57	3.46	
5903	C	0.00	0.00		2608	F	3.24	0.00		4905	F	0.00	0.00		8807	F	5.25	2.92		7151	S	4.63	3.08	
5904	C	0.00	0.00		2609	F	0.00	0.00		4906	F	0.00	0.00		8808	F	5.01	2.77		7152	S	0.00	0.00	
5905	C	0.00	0.00		2610	F	4.43	0.00		4907	F	0.00	0.00		8901	F	0.00	0.00		7152	S	4.80	2.90	
6001	C	26.10	22.03		2611	F	5.19	2.89		4908	F	0.00	0.00		8901	F	4.31	1.45		7153	S	4.79	2.82	
6101	C	24.51	21.21		2612	F	0.00	0.00		4909	F	0.00	0.00		8902	F	0.00	0.00		7851	S	4.17	2.96	
6404	C	17.73	0.00		2613	F	0.00	0.00		4910	F	0.00	0.00		8902	F	3.75	0.85		785C	S	0.00	0.00	
6405	C	17.93	15.81		2614	F	5.11	3.11		4911	F	0.00	0.00		8903	F	4.49	3.63		7950	S	4.33	0.00	
6406	C	15.68	0.00		2615	F	0.00	0.00		4912	F	0.00	0.00		8904	F	0.00	0.00		7951	S	5.10	3.72	
6501	C	13.99	11.99		2616	F	3.14	1.91		4913	F	0.00	0.00		9001	F	15.42	10.45		7952	S	4.19	0.00	
6807	C	9.42	0.00		2618	F	0.00	2.21		4914	F	0.00	0.00		9002	F	0.00	0.00		7953	S	4.34	0.00	
6809	C	11.60	5.53		2619	F	0.00	0.00		4915	F	0.00	0.00		9701	F	10.59	8.04		8150	S	0.00	0.00	
6812	C	9.74	0.00		2620	F	0.00	0.00		4916	F	0.00	0.00		9801	F	6.09	5.27		8151	S	0.00	0.00	
6814	C	10.06	5.21		2621	F	0.00	0.00		4917	F	0.00	0.00		9802	F	6.59	5.54		8850	S	0.00	0.00	
7301	C	25.56	22.68		2622	F	0.00	0.00		5001	F	7.76	5.31		9803	F	10.35	9.23		885C	S	0.00	0.00	
7401	C	18.62	16.30		2704	F	4.09	0.00		5002	F	7.81	5.50		9804	F	10.28	8.62		8950	S	4.21	0.00	
7402	C	20.09	15.87		2706	F	4.60	3.48		5003	F	25.49	0.00		9805	F	10.22	9.50		8951	S	4.27	2.93	
7601	C	11.21	9.00		2707	F	0.00	0.00		5003	F	10.14	0.00		9806	F	10.35	0.00		8952	S	3.92	2.89	
7701	C	7.65	5.21		2708	F	6.17	5.04		5004	F	25.07	24.47		9807	F	9.91	8.27		8953	S	3.70	2.74	
7702	C	9.22	0.00		2709	F	5.80	0.00		5004	F	9.88	7.64		9808	F	9.73	7.48		9050	S	0.00	0.00	
8301	C	21.27	18.56		2710	F	0.00	0.00		5005	F	24.86	24.16		9809	F	8.50	7.00		975C	S	0.00	0.00	
8401	C	19.35	17.05		2711	F	3.27	2.21		5005	F	7.81	5.50		9810	F	10.27	9.41		9950	S	3.50	2.65	
8701	C	10.76	5.05		2712	F	3.06	1.33		5006	F	6.89	0.00		9811	F	8.78	7.79						
9702	C	13.68	4.92		2713	F	3.18	1.93		5007	F	8.51	6.32		9812	F	7.68	6.19						
9902	C	12.00	8.60		2714	F	98.00	92.75		5008	F	7.84	5.68		9901									



© Crown copyright and database rights 2022 Ordnance Survey 100030737
Data updated: 16/06/22

Scale: 1:2500
Map Centre: 565861.17025
Data: 05/02/22
Our Ref: 166818-1
Weymouth Plan 02
Produced by dgipl

Final Quality	Construction Quality	Unfinished Water Supply	Unfinished Sewerage	Unfinished Other
100%	90%	80%	70%	60%
50%	40%	30%	20%	10%
0%	0%	0%	0%	0%

Water Supply	Sewerage	Other
100%	90%	80%
50%	40%	30%
0%	0%	0%

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accepts no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd © Crown copyright and database rights 2022 Ordnance Survey 100030737. This map is to be used for the purposes of viewing the location of Southern Water pipes only. Any other uses of the map data is not permitted.

WARNING: BAC pipes are constructed of Borel Adhesive Cement.

WARNING: Unknown (BAC) materials may include Borel Adhesive Cement.



Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
0001	C	10.36	0.00	
0002	C	10.75	6.72	
0003	C	0.00	0.00	
0201	C	9.97	6.17	
0909	C	10.54	0.00	
3206	C	27.79	0.00	
4009	C	0.00	0.00	
4216	C	41.63	0.00	
4601	C	0.00	0.00	
4708	C	0.00	0.00	
5001	C	30.58	0.00	
5002	C	28.20	23.28	
5101	C	22.77	20.59	
5102	C	22.53	20.48	
5104	C	21.87	20.35	
5108	C	22.52	0.00	
5201	C	22.21	19.89	
5602	C	29.71	0.00	
5701	C	29.47	25.82	
5702	C	29.47	25.66	
5801	C	0.00	0.00	
5802	C	28.50	0.00	
5903	C	0.00	0.00	
5904	C	0.00	0.00	
5905	C	0.00	0.00	
6001	C	26.10	22.03	
6101	C	24.51	21.21	
9902	C	12.00	8.60	
0001	F	0.00	0.00	
0002	F	0.00	0.00	
0003	F	0.00	0.00	
0004	F	0.00	0.00	
0004	F	0.00	0.00	
0005	F	0.00	0.00	
0005	F	11.34	8.09	
0006	F	0.00	0.00	
0006	F	9.75	8.89	
0007	F	0.00	0.00	
0007	F	10.34	0.00	
0008	F	0.00	0.00	
0008	F	0.00	0.00	
0009	F	0.00	0.00	
0009	F	10.93	0.00	
0010	F	0.00	0.00	
0010	F	0.00	0.00	
0011	F	0.00	0.00	
0011	F	11.22	5.51	
0012	F	0.00	0.00	
0012	F	10.99	5.45	
0013	F	0.00	0.00	
0014	F	0.00	0.00	
0015	F	0.00	0.00	
0016	F	0.00	0.00	
0017	F	0.00	0.00	
0101	F	0.00	0.00	
0101	F	0.00	0.00	
0102	F	0.00	0.00	
0102	F	9.86	7.57	
0103	F	0.00	0.00	
0103	F	8.87	6.11	
0104	F	0.00	0.00	
0104	F	8.62	0.00	
0105	F	0.00	0.00	
0105	F	7.96	6.23	
0106	F	0.00	0.00	
0106	F	8.15	6.16	
0107	F	0.00	0.00	
0107	F	0.00	0.00	
0108	F	0.00	0.00	
0109	F	0.00	0.00	
0110	F	0.00	0.00	
0111	F	0.00	0.00	
0112	F	0.00	0.00	
0113	F	0.00	0.00	
0114	F	0.00	0.00	
0115	F	0.00	0.00	
0116	F	0.00	0.00	
0117	F	0.00	0.00	
0118	F	0.00	0.00	
0119	F	0.00	0.00	
0120	F	0.00	0.00	
0121	F	0.00	0.00	
0122	F	0.00	0.00	
0123	F	0.00	0.00	
0124	F	0.00	0.00	
0125	F	0.00	0.00	
0126	F	0.00	0.00	
0201	F	0.00	0.00	
0202	F	0.00	0.00	
0203	F	0.00	0.00	
0203	F	0.00	0.00	
0204	F	0.00	0.00	
0205	F	0.00	0.00	
0206	F	0.00	0.00	
0207	F	0.00	0.00	
0208	F	0.00	0.00	
0209	F	0.00	0.00	
0210	F	0.00	0.00	
0211	F	0.00	0.00	
0212	F	0.00	0.00	
0213	F	0.00	0.00	
0301	F	0.00	0.00	
0302	F	0.00	0.00	
0303	F	0.00	0.00	
0304	F	0.00	0.00	
0305	F	0.00	0.00	
0308	F	0.00	0.00	
0309	F	0.00	0.00	
0310	F	0.00	0.00	
0311	F	0.00	0.00	
0312	F	0.00	0.00	
0313	F	0.00	0.00	
0314	F	0.00	0.00	
0315	F	0.00	0.00	
0316	F	0.00	0.00	
0317	F	0.00	0.00	
0318	F	0.00	0.00	
0319	F	0.00	0.00	
0320	F	0.00	0.00	
0321	F	0.00	0.00	
0322	F	0.00	0.00	
0323	F	0.00	0.00	
0324	F	0.00	0.00	
0325	F	0.00	0.00	
0326	F	0.00	0.00	
0401	F	0.00	0.00	
0402	F	0.00	0.00	
0403	F	0.00	0.00	
0404	F	0.00	0.00	
0405	F	0.00	0.00	
0406	F	0.00	0.00	
0407	F	0.00	0.00	
0408	F	0.00	0.00	
0409	F	0.00	0.00	
0410	F	0.00	0.00	
0411	F	0.00	0.00	
0412	F	0.00	0.00	
0413	F	0.00	0.00	
0414	F	0.00	0.00	
0415	F	0.00	0.00	
0416	F	0.00	0.00	
0417	F	0.00	0.00	
0418	F	0.00	0.00	
0419	F	0.00	0.00	
0420	F	0.00	0.00	
0421	F	0.00	0.00	
0422	F	0.00	0.00	
0423	F	0.00	0.00	
0424	F	0.00	0.00	
0425	F	0.00	0.00	
0426	F	0.00	0.00	
0501	F	26.80	25.74	
0502	F	26.19	24.82	
0503	F	26.05	24.61	
0504	F	25.16	24.53	
0505	F	25.03	0.00	
0506	F	25.69	24.42	
0507	F	25.12	24.21	
0508	F	25.45	23.88	
0509	F	24.81	0.00	
0510	F	24.57	23.10	
0601	F	25.31	24.63	
0602	F	23.95	23.03	
0603	F	23.49	22.76	
0604	F	22.62	22.07	
0605	F	21.98	20.31	
0606	F	0.00	0.00	
0607	F	0.00	0.00	
0608	F	0.00	0.00	
0609	F	0.00	0.00	
0610	F	0.00	0.00	
0611	F	0.00	0.00	
0612	F	0.00	0.00	
0701	F	18.31	15.62	
0702	F	14.73	13.68	
0703	F	15.59	11.36	
0704	F	21.23	19.82	
0705	F	21.19	20.30	
0706	F	20.32	18.13	
0707	F	17.90	17.19	
0708	F	18.22	16.88	
0709	F	20.32	19.22	
0710	F	17.83	0.00	
0801	F	42.94	40.94	
0801	F	14.26	12.87	
0802	F	46.91	45.91	
0802	F	20.32	0.00	
0803	F	46.17	45.35	
0803	F	17.15	15.55	
0804	F	17.00	15.25	
0805	F	0.00	0.00	
0806	F	0.00	0.00	
0807	F	0.00	0.00	
0808	F	14.27	11.78	
0812	F	48.32	46.18	
0901	F	43.59	42.04	
0901	F	12.52	10.38	
0902	F	41.26	39.97	
0902	F	12.18	10.12	
0903	F	11.20	10.03	
0904	F	0.00	0.00	
0905	F	11.09	9.77	
0906	F	11.04	9.39	
0907	F	10.96	0.00	
0908	F	10.51	8.41	
0910	F	10.74	8.62	
0911	F	9.30	0.00	
1001	F	0.00	0.00	
1001	F	9.97	9.03	
1002	F	0.00	0.00	
1002	F	0.00	0.00	
1003	F	0.00	0.00	
1003	F	0.00	0.00	
1004	F	0.00	0.00	
1004	F	10.91	0.00	
1005	F	0.00	0.00	
1005	F	10.68	7.91	
1006	F	0.00	0.00	

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
1006	F	13.10	11.31	
1007	F	27.44	0.00	
1007	F	12.77	10.91	
1008	F	0.00	0.00	
1008	F	0.00	0.00	
1009	F	0.00	0.00	
1010	F	0.00	0.00	
1011	F	0.00	0.00	
1012	F	0.00	0.00	
1013	F	0.00	0.00	
1014	F	0.00	0.00	
1015	F	0.00	0.00	
1101	F	0.00	0.00	
1101	F	0.00	0.00	
1102	F	0.00	0.00	
1102	F	8.25	7.06	
1103	F	0.00	0.00	
1103	F	0.00	0.00	
1104	F	0.00	0.00	
1104	F	0.00	0.00	
1105	F	0.00	0.00	
1105	F	0.00	0.00	
1106	F	0.00	0.00	
1106	F	0.00	0.00	
1107	F	0.00	0.00	
1107	F	0.00	0.00	
1107	F	0.00	0.00	
1108	F	0.00	0.00	
1108	F	0.00	0.00	
1109	F	0.00	0.00	
1110	F	0.00	0.00	
1111	F	0.00	0.00	
1112	F	0.00	0.00	
1113	F	0.00	0.00	
1114	F	0.00	0.00	
1115	F	0.00	0.00	
1201	F	0.00	0.00	
1202	F	0.00	0.00	
1203	F	0.00	0.00	
1204	F	0.00	0.00	
1205	F	0.00	0.00	
1206	F	0.00	0.00	
1207	F	0.00	0.00	
1208	F	0.00	0.00	
1208	F	0.00	0.00	
1210	F	0.00	0.00	
1210	F	0.00	0.00	
1301	F	0.00	0.00	
1302	F	0.00	0.00	
1303	F	0.00	0.00	
1304	F	0.00	0.00	
1305	F	0.00	0.00	
1306	F	0.00	0.00	
1307	F	0.00	0.00	
1308	F	0.00	0.00	
1309	F	0.00	0.00	
1310	F	0.00	0.00	
1311	F	0.00	0.00	
1312	F	0.00	0.00	
1313	F	0.00	0.00	
1314	F	0.00	0.00	
1315	F	0.00	0.00	
1316	F	0.00	0.00	
1317	F	0.00	0.00	
1318	F	0.00	0.00	
1402	F	0.00	0.00	
1403	F	0.00	0.00	
1404	F	0.00	0.00	
1405	F	0.00	0.00	
1406	F	0.00	0.00	
1407	F	0.00	0.00	
1408	F	0.00	0.00	
1409	F	0.00	0.00	
1410	F	0.00	0.00	
1411	F	0.00	0.00	
1412	F	0.00	0.00	
1413	F	0.00	0.00	
1414	F	0.00	0.00	
1415	F	0.00	0.00	
1416	F	0.00	0.00	
1417	F	0.00	0.00	
1418	F	0.00	0.00	
1419	F	0.00	0.00	
1501	F	29.56	27.87	
1502	F	29.82	28.32	

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert	Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert	Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert	Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert	Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert	Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert	Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert	Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert	
0002	C	21.61	18.86		0008	F	0.00	0.00		1306	F	0.00	0.00		3803	F	0.00	1.10		5110	F	0.00	0.00		7001	F	0.00	0.00		8814	F	0.00	0.00		2650	S	0.00	0.00		
0003	C	14.08	0.00		0009	F	0.00	0.00		1307	F	0.00	0.00		3804	F	0.00	14.07	17.15	7003	F	0.00	0.00		7003	F	0.00	0.00		8815	F	0.00	0.00		2650	S	0.00	0.00		
0004	C	21.16	0.00		0009	F	0.00	0.00		1401	F	19.08	17.72		3804	F	0.00	0.00		5112	F	0.00	0.00		7004	F	0.00	0.00		8804	F	0.00	0.00		295C	S	0.00	0.00		
0004	C	17.20	0.00		0009	F	0.00	0.00		1402	F	18.47	16.81		3805	F	0.00	0.00		5201	F	15.34	12.15		7005	F	0.00	0.00		8905	F	19.34	16.01		296C	S	0.00	0.00		
0102	C	22.02	17.24		0010	F	14.53	11.72		1402	F	29.08	27.30		3805	F	0.00	0.00		5202	F	15.33	11.87		7007	F	18.74	17.28		8908	F	19.21	17.43		3050	S	0.00	0.00		
0210	C	0.00	0.00		0011	F	0.00	0.00		1403	F	0.00	0.00		3806	F	20.55	0.00		5203	F	15.42	11.85		7008	F	0.00	0.00		8910	F	19.24	0.00		3051	S	0.00	0.00		
0211	C	0.00	0.00		0101	F	0.00	0.00		1403	F	25.61	24.54		3806	F	0.00	0.00		5204	F	13.79	11.43		7009	F	0.00	0.00		8912	F	19.76	0.00		3062	S	0.00	0.00		
0212	C	0.00	0.00		0102	F	16.81	14.03		1501	F	0.00	14.48	12.46		3807	F	21.17	20.57		5205	F	14.40	11.05		7010	F	0.00	0.00		9001	F	19.14	16.66		3063	S	0.00	0.00	
0301	C	12.64	0.00		0103	F	0.00	0.00		1501	F	0.00	0.00		3807	F	21.10	20.32		5206	F	0.00	0.00		7011	F	0.00	0.00		9002	F	0.00	0.00		3150	S	0.00	0.00		
0408	C	31.31	28.29		0104	F	14.99	10.61		1502	F	0.00	0.00		3810	F	0.00	0.00		5207	F	13.37	11.17		7012	F	0.00	0.00		9003	F	0.00	0.00		3250	S	17.64	16.70		
0410	C	30.44	0.00		0105	F	0.00	0.00		1502	F	0.00	0.00		3811	F	21.41	20.41		5208	F	12.66	10.29		7101	F	15.94	13.32		9004	F	0.00	0.00		3250	S	0.00	0.00		
0501	C	19.98	7.74		0106	F	0.00	0.00		1503	F	0.00	0.00		3812	F	21.31	20.55		5209	F	11.18	9.98		7102	F	0.00	0.00		9005	F	0.00	0.00		3251	S	17.07	15.47		
0502	C	28.55	0.00		0107	F	0.00	0.00		1503	F	0.00	0.00		3813	F	21.38	20.58		5210	F	10.56	8.96		7103	F	0.00	0.00		9006	F	0.00	0.00		3251	S	0.00	0.00		
0504	C	0.00	0.00		0108	F	0.00	0.00		1504	F	0.00	0.00		3814	F	21.34	20.38		5211	F	10.70	9.00		7105	F	0.00	0.00		9007	F	13.40	15.19		3252	S	0.00	0.00		
0601	C	20.42	0.00		0109	F	16.04	13.50		1505	F	0.00	0.00		3815	F	21.39	20.35		5212	F	0.00	0.00		7106	F	0.00	0.00		9008	F	0.00	0.00		325C	S	0.00	0.00		
0601	C	25.71	23.17		0110	F	0.00	0.00		1506	F	0.00	0.00		3816	F	21.34	20.25		5213	F	11.20	0.00		7107	F	16.00	14.56		9009	F	0.00	0.00		326C	S	0.00	0.00		
0602	C	20.41	16.71		0111	F	0.00	0.00		1507	F	0.00	0.00		3817	F	21.16	19.86		5214	F	11.09	0.00		7113	F	0.00	0.00		9011	F	17.21	14.28		327C	S	0.00	0.00		
0604	C	20.35	0.00		0200	F	5.69	2.70		1508	F	0.00	0.00		3701	F	0.00	15.32		5301	F	8.08	6.38		7202	F	0.00	0.00		9012	F	0.00	0.00		3350	S	0.00	0.00		
0605	C	20.32	7.67		0201	F	5.92	3.72		1509	F	0.00	0.00		3702	F	0.00	0.00		5302	F	6.67	5.09		7205	F	0.00	0.00		9013	F	0.00	0.00		3450	S	19.38	7.92		
0701	C	20.75	19.54		0203	F	0.00	0.00		1510	F	0.00	0.00		3703	F	0.00	0.00		5303	F	0.00	0.00		7208	F	0.00	0.00		9013	F	0.00	0.00		3450	S	20.03	7.54		
0704	C	21.22	19.76		0204	F	0.00	0.00		1511	F	0.00	0.00		3704	F	0.00	0.00		5304	F	7.22	5.22		7302	F	0.00	0.00		9102	F	0.00	0.00		3551	S	18.61	7.60		
0906	C	17.25	0.00		0206	F	0.00	0.00		1512	F	0.00	0.00		3705	F	0.00	0.00		5305	F	5.30	0.00		7302	F	10.17	8.76		9103	F	0.00	0.00		3650	S	20.63	7.26		
1002	C	20.80	0.00		0207	F	15.82	0.00		1601	F	0.00	0.00		3802	F	0.00	0.00		5401	F	0.00	0.00		7303	F	0.00	0.00		9104	F	0.00	0.00		3650	S	0.00	0.00		
1003	C	20.76	0.00		0213	F	14.41	10.93		1602	F	20.43	0.00		3803	F	0.00	0.00		5402	F	0.00	0.00		7304	F	0.00	0.00		9105	F	0.00	0.00		3651	S	20.32	7.41		
1004	C	20.64	17.78		0214	F	11.20	0.00		1602	F	0.00	0.83		3803	F	0.00	0.00		5406	F	0.00	0.00		7305	F	0.00	0.00		9106	F	0.00	0.00		3651	S	0.00	0.00		
1005	C	20.77	17.50		0215	F	0.00	0.00		1603	F	20.47	17.15		3804	F	0.00	0.00		5501	F	23.21	21.35		7306	F	8.19	6.79		9107	F	0.00	0.00		3652	S	0.00	0.00		
1009	C	0.00	0.00		0216	F	0.00	0.00		1604	F	0.00	0.00		3804	F	15.17	13.26		5502	F	15.27	13.26		7307	F	18.28	16.26		9108	F	0.00	0.00		3750	S	21.03	6.90		
1010	C	0.00	0.00		0217	F	0.00	0.00		1605	F	0.00	0.00		3805	F	0.00	0.00		5503	F	0.00	0.00		7308	F	0.00	0.00		9109	F	18.28	15.60		3761	S	20.96	7.07		
1011	C	0.00	0.00		0302	F	0.00	0.00		1606	F	0.00	0.00		3805	F	16.70	14.28		5504	F	0.00	0.00		7309	F	0.00	0.00		9110	F	17.68	15.18		3850	S	20.99	6.78		
1012	C	12.20	9.21		0303	F	0.00	0.00		1701	F	20.92	19.22		3806	F	0.00	0.00		5506	F	0.00	0.00		7310	F	0.00	0.00		9111	F	0.00	0.00		395C	S	0.00	0.00		
1013	C	0.00	0.00		0304	F	0.00	0.00		1701	F	19.29	17.16		3806	F	16.80	14.59		5507	F	0.00	0.00		7311	F	4.94	4.02		9112	F	0.00	0.00		4050	S	19.39	9.99		
1014	C	12.10	0.00		0305	F	0.00	0.00		1702	F	20.86	19.05		3807	F	20.99	0.00		5508	F	23.25	21.39		7315	F	0.00	0.00		9113	F	0.00	0.00		4050	S	0.00	0.00		
1101	C	0.00	0.00		0306	F	0.00	0.00		1703	F	20.80	20.58		3901	F	0.00	0.00		5509	F	22.80	21.00		7316	F	0.00	0.00		9114	F	0.00	0.00		4150	S	6.90	5.50		
1113	C	0.00	0.00		0307	F	0.00	0.00		1704	F	20.68	19.31		3902	F	13.51	11.47		5510	F	22.75	20.14		7402	F	0.00	0.00		9115	F	19.29	17.79		4151	S	0.00	0.00		
1301	C	0.00	0.00		0308	F	0.00	0.00		1705	F	20.74	19.57		4001	F	0.00	0.00		5511	F	0.00	0.00		7403	F	34.04	0.00		9119	F	0.00	0.00		4152	S	0.00	0.00		
1302	C	0.00	0.00		0309	F	7.35	5.66		1706	F	21.05	20.69		4002	F	0.00	0.00		5512	F	22.36	20.07		7405	F	0.00	0.00		9121	F	0.00	0.00		4153	S	5.51	0.00		
1303	C	0.00	0.00		0310	F	6.93	0.00		1707	F	21.04	20.26		4003	F	0.00	0.00		5513	F	22.33	0.00		7501	F	0.00	0.00		9201	F	17.46	15.88		4154	S	7.25	5.88		
1308	C	11.76	0.00		0311	F	5.21	0.00		1708	F	20.99	19.79		4004	F	0.00	0.00		5514	F	0.00	0.00		7502	F	0.00	0.00		9202	F	0.00	0.00		4162	S	7.00	4.56		
1401	C	0.00	0.00		0403	F	34.67	0.00		1801	F	0.00	24.60	21.22		4005	F	0.00	0.00		5615	F	24.60	21.22		7503	F	0.00	0.00		9203	F	0.00	0.00		4251	S	0.00	0.00	
1709	C	20.91	0.00		0405	F	33.90	31.83		1801	F	0.00	0.00		4005	F	0.00	0.00		5601	F	0.00	0.00		7504	F	31.21	0.00		9204	F	0.00	0.00		425C	S	0.00	0.00		
1803	C	20.76	0.00		0406	F	31.69	30.10		1802	F	20.97	18.91		4006	F	0.00	0.00		56																				

amazi

www.amazi.co.uk

cover photography: Lindsey Wakelin