PATRICK PARSONS

CREATING PLACES / FOR FUTURE GENERATIONS TO THRIVE

Drainage (SuDS) Strategy

Furniss Business Center, Furniss Way

Hayling Island, PO11 0FG

for

Hayling Island Builders Limited

11648

May 2023

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Executive Summary

Description	
Patrick Parsons has been instructed by Hayling Island Builders Limited, to produce a Drainage (SuDS) Strategy to support the Planning Application for the site at Furniss Business Center, Furniss Way, Hayling Island, PO11 0FG.	
Site Parameters	
Total Area: Greenfield: Brownfield: Mixed Green and Brownfield: Existing Runoff Location: Ground Conditions: Method of Study: Ground Infiltration Potential:	920m² (0.09 Ha) YES NO NO Ground. Clay Desk Investigation Low
Drainage Strategy / SuDS	
Infiltration Viable: Discharge Point (SW): Flow Control: Storage Provided: Discharge Point (FW):	NO Watercourse / Existing Sewer 1.0 l/s 1 in 100 Year + 40% Climate Change Sewer
SuDS Elements: Water Quality Measures: Exceedance flows:	Porous Surfacing Catchpits, Permeable Paving Managed within site
Conclusions	
Infiltration is unlikely to be viable on site and so attenuation is provided in porous surfacing systems.	

1.0 Introduction

1.1 Hayling Island Builders Limited is planning a proposed development on the site at Furniss Business Center, Furniss Way, Hayling Island, PO11 0FG.

1.2 Patrick Parsons has been instructed by Hayling Island Builders Limited, to produce a Drainage (SuDS) Strategy to support the Planning Application.

1.3 This report aims to demonstrate that the site is not at risk of any form of flooding.

1.4 The general limitations of this assessment are that:

- Several data sources have been used in compiling this report. Whilst Patrick Parsons believes them to be trustworthy; it is unable to guarantee the accuracy of the information that has been provided by others.
- This report is based on information available at the time of preparation. There is potential for further information to become available, which may create a need to modify conclusions drawn in this report.

2.0 Location of Site

2.1 The site is located to the east off Furniss Way in Hayling Island. A location plan is enclosed in **Appendix A**.

2.2 The Local Authorities are Havant Borough Council and Hampshire County Council.

3.0 Site Description

3.1 Existing Site

3.1.1 The existing site is the Furniss Business Center off Furniss Way, Hayling Island. An existing site layout can be found in **Appendix B**.

3.2 Existing Geology

3.2.1 The geology of the site has been ascertained by reference to the 1:50,000 British Geological Survey website. The data provided on the website indicates the bedrock and superficial drift geology for the site.

3.2.2 The strata of the site (bedrock geology) comprises London Clay formation, described as follows:

3.2.3 *"London Clay Formation - Clay, Silt and Sand. Sedimentary Bedrock formed approximately 48 to 56 million years ago in the Palaeogene Period. Local environment previously dominated by deep seas. These sedimentary rocks are marine in origin. They are detrital and comprise coarse- to fine-grained slurries of debris from the continental shelf flowing into a deep-sea environment, forming distinctively graded beds."*

3.2.4 The strata of the site (superficial drift) comprises River Terrace Deposits, described as follows:

"River Terrace Deposits (undifferentiated) - Sand, Silt and Clay. Superficial Deposits formed up to 3 million years ago in the Quaternary Period. Local environment previously dominated by rivers (U). These sedimentary deposits are fluvial in origin. They are detrital, ranging from coarse- to fine-grained and form beds and lenses of deposits reflecting the channels, floodplains and levees of a river or estuary (if in a coastal setting).

3.3 Existing Drainage System

3.3.1 Sewer records were obtained from Southern Water and can be found at **Appendix C**. There are public foul water and surface water sewers located within Furniss Way.

3.3.2 There is a public 150mm diameter foul water sewer within Furniss Way. The closest public manhole is No. 9801 with cover level 5.63m AOD and an invert level of 4.70m AOD.

3.3.3 There is a public 225mm diameter surface water sewer within Furniss Way. The closest public manhole is No. 9850 with cover level 5.82m AOD and an unknown invert level.

3.3.4 As the application site sits directly next to an existing business park with several units, there are existing onsite drainage networks for both foul and surface water. Surface water runoff generated from the roofs is drained via the rear of the site and discharges into the existing landscaping swale to the northern boundary of the site which forms part of the Barrat Homes design. Runoff generated within the parking and access area drains into a linear drainage

channel which discharges into a petrol interceptor before connecting into the landscaping swale to the north.

3.3.5 Foul water is drained via various pipes and manholes before being pumped at a rate of 3.8 l/s to an existing private foul manhole to the south of the site.

3.4 Geological Assessment

3.4.1 Boreholes in the local area indicate predominantly clay with seams of sand and gravel. They also indicate a groundwater strike at approximately 1.5m below ground level.

3.4.2 It has not been possible to undertake site investigations at the time of writing this report to determine the underlying geology. It is recommended that a full geotechnical investigation be completed prior to any detailed design of the scheme.

3.4.3 Based on the desk study information on the geology of the site, infiltration is not likely to be suitable for the development. The requirement for a positive surface water discharge has been considered in this report.

3.5 Hydrogeology Setting

3.5.1 The Environment Agency (EA) mapping service, as provided by Magic Map, indicates the aquifer designation for the bedrock and superficial drift geology and the groundwater vulnerability in the area. The mapping, as included at **Appendix D**, provide the following information for the site:

Geology Map	Site Description
Aquifer Designation (Bedrock)	Unproductive
Aquifer Designation (Superficial Drift)	Secondary A
Groundwater Vulnerability	Medium / Low
Groundwater Source Protection Zone	None

4.0 Site Run-Off

4.1.1 The site has not been previously developed, so an analysis of the Greenfield run-off rate is appropriate and will be made for the developable site area of 0.09 hectares.

4.1.2 The Greenfield run-off rates have been calculated for the existing site. The existing site run-off rates have been calculated based on the Interim Code of Practice for Sustainable Drainage Systems, Chapter 6 using the Micro Drainage design software. The output from the software analysis can be found at **Appendix E**.

4.1.3 The Qbar (rural) value for the site is 0.3 litres per second.

4.2 Greenfield Run-Off Assessment

4.2.1 An assessment of the most appropriate flow restriction on site can be made with an engineering judgement made on the following parameters:

- Proposed depth of surface water system. Shallow systems will not be able to construct certain flow controls.
- Risk of blockages, open drainage systems and conventional piped systems will have a significantly higher chance of blockage.
- Potential for soakage or a hybrid solution with some infiltration and some positive discharge.
- The existing use of the site (green/brown field) and the most appropriate reduction in surface water flows from the proposed development.
- Potential development costs and the viability of achieving very low flow rates on sites.
- Manufacturer limits, with Hydro-International stating they can achieve between 0.7 and 550 l/s on their product range.

4.3 Infiltration has not been selected, based on the geotechnical information provided within this report.

5.0 Proposed Development

5.1 The proposal is for 3 additional warehouse units which will form part of the existing 8 units at Furniss Business Center. A site plan is included at **Appendix F**.

5.2 **Infiltration Potential**

5.2.1 The geotechnical information provided in this report indicates that standard infiltration methods will not be suitable on site.

5.2.2 The table below summarises the potential for infiltration.

Low infiltration potential: There is a low potential for infiltration SuDS in parts of the Site. **Comments:** It is likely that the underlying geology at the Site, or in areas of the site, is relatively impermeable which would limit the effectiveness of a proposed infiltration SuDS scheme. **Recommendations:** Infiltration SuDS should be focused in more suitable parts of the site. If a site investigation confirms that infiltration SuDS are not possible at the site, then attenuation SuDS with a controlled discharge into a nearby surface water feature or existing surface water drainage is recommended.	**YES**
Moderate infiltration potential: There is a moderate potential for infiltration SuDS in parts of the Site. **Comments:** It is likely that the permeability of the underlying material at the site would be suitable for infiltration drainage. However, there may be constraints on the use of infiltration SuDS because of any of the following: a high water-table, the limited thickness of the receiving formation, the potential for a significant range in permeability in the underlying geology and confirmation of the infiltration capacity is recommended. **Recommendations:** A site investigation is recommended to investigate groundwater levels and formation thickness and to confirm that infiltration rates at the site are sufficient to accommodate an infiltration SuDS feature. If a site investigation confirms that infiltration SuDS are possible at the Site then assorted options can be considered for infiltration SuDS and these include infiltration trenches, soakaways, swales, permeable pavements and infiltration basins without outlets.	**NO**
High infiltration potential: There is a high potential for infiltration SuDS in parts of the Site. **Comments:** It is likely that the underlying geology at the Site is highly permeable and an infiltration SuDS scheme should be possible at the Site. Groundwater levels are expected to be sufficiently deep at the site. **Recommendations:** A site investigation is recommended to confirm the high infiltration capacity and the depth of the winter water table. Assorted options can be considered for infiltration SuDS and these include infiltration trenches, soakaways, swales, permeable pavements and infiltration basins without outlets.	**NO**

6.0 Sustainable Drainage Assessment

6.1 SuDS Hierarchy

6.1.1 Options for the destination for the run-off generated on site have been assessed in line with the prioritisation set out in the Building Regulations Part H document and DEFRA's Draft National Standards for SuDS as follows:

Discharge to Ground	**Not viable based on desk study**
Discharge to Watercourse	**Selected Option**
Discharge to Surface Water Sewer	**N/A**
Discharge to Other Sewer	**N/A**

6.1.2 The indicative potential for different SuDS devices has been assessed and can be seen in the table below:

SuDS Feature	Environmental benefits	Water quality improvement	Suitability for low permeability soils ($k<10^{-6}$)	Ground-water recharge	Suitable for small / confined sites?	Site specific restrictions	Appropriate for subject site?
Wetlands	✓	✓	✓	X	X	Site Constraints	No
Retention ponds	✓	✓	✓	X	X	Site Constraints	No
Detention basins	✓	✓	✓	X	X	Site Constraints	No
Infiltration basins	✓	✓	X	✓	X	Poor Ground	No
Soakaways	X	✓	X	✓	✓	Poor Ground	No
Underground storage	X	X	✓	X	✓	None	Yes
Swales	✓	✓	✓	✓	X	Site Constraints	No
Filter strips	✓	✓	✓	✓	X	None	Yes
Rainwater harvesting	X	✓	✓	✓	✓	None	Yes
Permeable paving	X	✓	✓	✓	✓	None	Yes
Green roofs	✓	✓	✓	X	✓	N/A	No
Rain Garden (external)	✓	✓	✓	X	X	Site Constraints	No
Rain Garden (planter)	✓	✓	✓	X	X	Site Constraints	No

6.2 Detailed SuDS Assessment

6.2.1 To maximize the potential use of SuDS at the site, a review has been undertaken in accordance with the SuDS Hierarchy (refer to SuDS: A Practical Guide prepared by the Environment Agency).

6.2.2 The following table indicates the potential setting for SuDS elements:

	Description	Setting	Required Area
Green Roof	A planted soil layer is constructed on the roof of a building to create a living surface. Water is stored in the soil layer and absorbed by vegetation.	Building	Building integrated
Rainwater Harvesting	Rainwater is collected from the roof of a building or from other paved surfaces and stored in an overground or underground tank for treatment and reuse locally. Water could be used for toilet flushing and irrigation.	Building	Water storage (underground or above ground)
Soakaway	A soakaway is designed to allow water to quickly soak into permeable layers of soil. Constructed like a dry well, an underground pit is dug filled with gravel or rubble. Water can be piped to a soakaway where it will be stored and allowed to gradually seep into the ground.	Open Space	Dependant on Run-off volumes and soils
Filter Strip	Filter strips are grassed or planted areas that runoff can run across to promote infiltration and cleansing.	Open Space	Maximum length 5 metres
Permeable Paving	Paving which allows water to soak through. Can be in the form of paving blocks with gaps between solid blocks or porous paving where water filters through the block itself. Water can be stored in the sub-base beneath or allowed to infiltrate into ground below.	Street / Open Space	Can typically drain double its area
Bioretention Area	A vegetated area with gravel and sand layers below designed to channel, filter and cleanse water vertically. Water can infiltrate into the ground below or drain to a perforated pipe and be conveyed elsewhere. Bioretention systems can be integrated with tree-pits or gardens.	Street / Open Space	Typically, surface area is 5-10% of drained area with storage below.
Swale	Swales are vegetated shallow depressions designed to convey and filter water. These can be 'wet' where water gathers above the surface, or 'dry' where water gathers in a gravel layer beneath. Can be lined or unlined to allow infiltration.	Street / Open Space	Account for width to allow safe maintenance typically 2-3 metres wide.
Hardscape Storage	Hardscape water features can be used to store run-off above ground within a constructed container. Storage features can be integrated into public realm areas with a more urban character.	Open Space	Could be above or below ground and sized to storage need.
Pond / Basin	Ponds can be used to store and treat water. 'Wet' ponds have a constant body of water and run-off is additional, while 'dry' ponds are empty during periods without rainfall. Ponds can be designed to allow infiltration into the ground or to store water for a period of time before discharge.	Open Space	Dependant on runoff volumes and soils.
Wetland	Wetlands are shallow vegetated water bodies with a varying water level. Specially selected plant species are used to filter water. Water flows horizontally and is gradually treated before being discharged. Wetlands can be integrated with a natural or hardscape environment.	Open Space	Typically, 5-15% of drainage area to provide good treatment.
Underground Storage	Water can be stored in tanks, gravel or plastic crates beneath the ground to provide attenuation.	Open Space	Dependant on runoff volumes and soils.

6.2.3 This review highlights the components referenced in the SuDS Hierarchy and provides recommendations on whether the components could be incorporated into the development.

Component	Recommendation / Opinion	
Green (living) roofs or Blue/Green roof systems	There is no scope for blue or green roofs on the development.	↓
Basins and Ponds	There is no potential for basins and ponds on the site due to lack of space.	↓
Filter Strips and Swales	There is some scope for use of surface mounted SuDS on the scheme to convey water, subject to further design.	↓
Infiltration Devices	Infiltration devices are unlikely to be viable on site.	↓
Permeable Surfaces and Filter Drains	Porous surfaces should be viable on site in a tanked configuration.	↓
Tanked Systems	It is unlikely that these will be required.	↓

6.2.4 The proposed drainage system incorporates sustainable drainage features in accordance with the SuDS hierarchy, current legislation and best practice as much as practicable on site.

6.2.5 There may be an opportunity for small scale bespoke SuDS elements (such as planters and filtration beds) to be included as part of the landscaping proposals. These should be considered fully before construction commences.

7.0 Drainage Proposal

7.1 Surface Water Drainage

7.1.1 Surface water drainage at the site will follow the Sustainable Drainage Systems (SuDS) management train. The surface water from the site will discharge into the existing landscaping swale to the north of the site via the existing drainage network on site.

7.1.2 Permeable paving will be provided in the car parking areas and will provide storage for the runoff in this area before being discharged via a 33mm orifice plate (1 l/s) to the existing ditch to the south west. The commercial yard will have a linear drainage channel as per the current situation for the Business Center and will tie into this network and drain to the petrol interceptor to the north before discharging into the landscaping swale. A Drainage Plan can be found at **Appendix G**.

7.1.3 New climate change allowances have been in force since February 19th, 2016. The new allowances take into consideration the design life of the development, flood zone, development type and geographical location.

7.1.4 Based on these parameters, the Central value for rainfall intensity should be used. Based on Table 2 (shown below), this is a range between 20% and 40% for the central and upper end values. Therefore, it is appropriate to use 40% on this development for design.

Table 2 peak rainfall intensity allowance in small and urban catchments (use 1961 to 1990 baseline)

Applies across all of England	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2115)
Upper end	10%	20%	40%
Central	5%	10%	20%

7.1.5 Any water up to a 1 in 100 year storm event including 40% climate change will be attenuated within the curtilage of the site in the proposed drainage system.

7.1.6 National SuDS standards, the Design and Construction Guidance 2020 and Sewers for Adoption recommend that the 1 in 30 year storm event is managed below ground with exceedance flows managed above ground.

7.1.7 MicroDrainage quick storage calculations have been undertaken for the permeable paving areas, which can be found in the figures below. Due to the method of surface water management and most of the proposed drainage will discharge into the existing drainage network on site at low rates, a full Simulation model was not appropriate for the site.

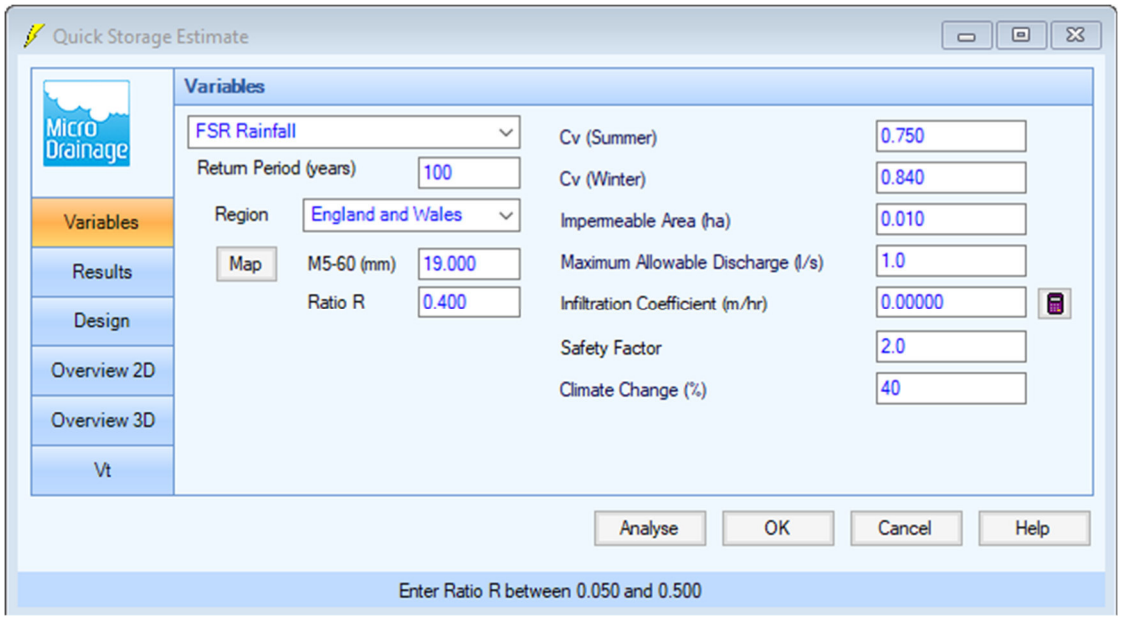

Figure 1 Quick Storage Estimate – Variables

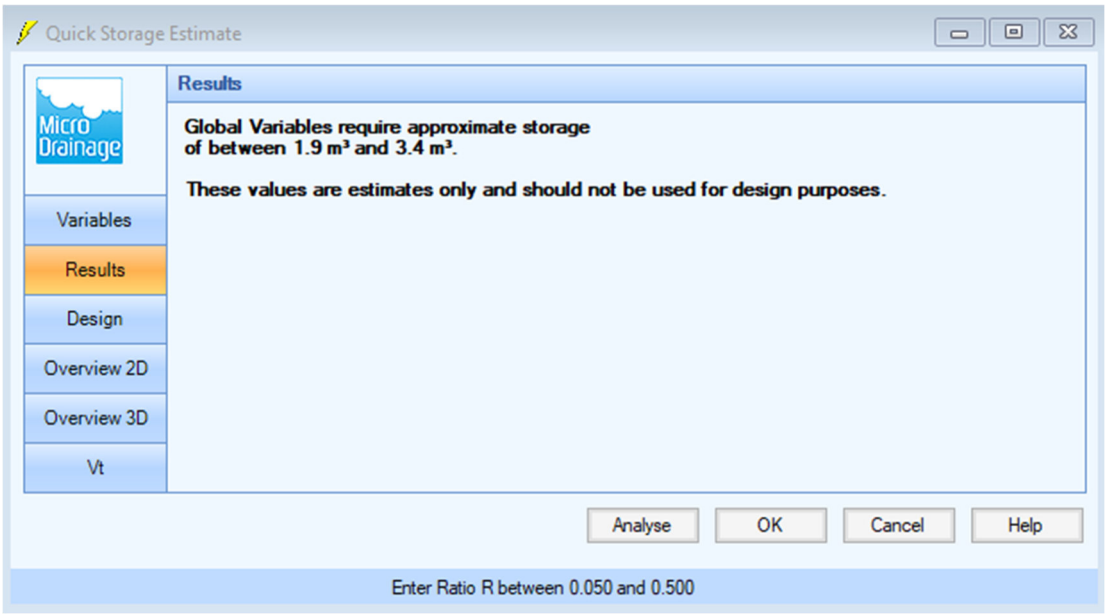

Figure 2 Quick Storage Estimate – Results

7.1.8 The system as drawn will not experience flooding in a 100 year event plus climate change and so is proof of concept for the scheme, to be developed further at the next design stage.

7.2 Existing Watercourse

7.2.1 It is intended to culvert the existing ditch on the south western boundary of the site to allow for car parking and access to the additional units. This will require an ordinary watercourse consent for the works which will affect the watercourse.

7.3 Designing for Exceedance Events

7.3.1 Current best practice guidance on flood risk requires an evaluation of how rainfall events beyond the design capacity of the proposed drainage system would be managed and what effects they are likely to have on flood risk at the site or surrounding areas.

7.3.2 Should a rainfall event exceeding the 1.0% AEP (1 in 100 year) event plus climate change event occur, the proposed storage and flow paths of surface water should be considered.

7.3.3 The surface water SuDS features included for the 1 in 100 year storm will be designed with sufficient resilience to manage and convey exceedance flows away from any buildings to minimise risk.

7.4 Designing for System Failure

7.4.1 Current best practice on sustainable drainage design should consider failure of the surface water system and potential blockages from multiple sources. The potential risks to the surface water system have been indicated below:

Risk	Description	Comments / Recommendations
Blockage	Potential blockage of outfall from surface water system	Regular inspection and maintenance of the drainage system should be undertaken in line with the findings of this report
Failure	Potential blockage of outfall from flow control failure or build-up of debris	Regular inspection and maintenance of the drainage system should be undertaken in line with the findings of this report
Surcharge	Potential back-up of system due to surcharging or poorly maintained public surface water infrastructure or watercourse	Regular inspection and maintenance of the drainage system should be undertaken in line with the findings of this report
Blockage	Potential risk of flooding due to build-up of sediment within system	Catchpit manholes have been provided to remove solids and sediment. Regular inspection and maintenance of the drainage system should be undertaken in line with the findings of this report.
Failure	Potential risk of surface water flows from poor maintenance of surface mounted SuDS features (such as porous paving or swales)	Regular inspection and maintenance of the surface mounted SuDS should be undertaken in line with the findings of this report.
Surcharge	Potential risk of additional surface water flows or overland flows from extreme (exceedance storm) events in adjacent sites causing the surface water system to be overloaded.	Exceedance flow routes have been assessed and shown on the drainage layout.
Failure	Potential risk from failure of third-party specialist equipment such as pump stations or interceptors	Any pump stations or interceptors installed on site should be maintained in line with the specialist manufacturer's recommendations.
Blockage	Potential risk from poor maintenance of gullies	Regular inspection and maintenance of the underground drainage system should be undertaken in line with the findings of this report.
Blockage	Potential reduction in infiltration on site from compaction of soils during the construction phase	Ground consolidation should not have a major impact.
Failure	Poor planting and maintenance of green areas could reduce the hydraulic properties of SuDS devices (and amenity/biodiversity benefits)	Regular inspection and maintenance of the surface mounted SuDS should be undertaken in line with the findings of this report. The high groundwater table should be noted, and any observed risks reported.

7.5 Construction Phase Drainage

7.5.1 It is an offence to cause or knowingly permit the entry of poisonous, noxious or polluting material into the water environment. Prosecution may ensue if the pollution is serious enough to lower the ecological status of the water body in terms set by the Water Framework Directive (2000/60/EC).

7.5.2 The polluter does not have to be prosecuted first for remediation of damage to be required. If water pollution is serious enough to be classed as environmental damage the damage will require to be remediated such that the area is returned to the condition it would have been in if the damage had not occurred.

7.5.3 An offence may also be committed if environmental damage or the threat of environmental damage is not reported by the polluter or if no action is taken by the polluter to prevent further damage. Third parties (e.g. private water supply users, landowners, recreational users and the public) who may be affected by possible damage may also report 'risk' of environmental damage to the enforcing authority; in this instance an offence may be committed if action is not taken to prevent the potential environmental damage occurring.

7.5.4 The principles of Sustainable Drainage Systems (SuDS) shall be applied to all components of design and construction regarding surface water management. Any design or site works that may impact on the site drainage or water quality shall:

- Soakaway where soils allow
- Consider and manage erosion
- Retain any silts on site and prevent silts from discharging into watercourses or drains
- Remove pollutants in surface water
- Keep runoff rates at existing greenfield runoff
- Prevent accidental spillages reaching watercourses.

7.5.5 As infiltration is not expected to be viable on site, the temporary drainage for the development will be in the form of land drainage with discharge into the existing ditch, with the appropriate levels of treatment.

7.5.6 Pollution will be controlled via the use of catchpit manholes and geotextiles.

7.5.7 Any potentially hazardous substances (i.e. form plant / deliveries) will be within a controlled compound with a separate drainage system that will contain a penstock valve / containment kit in the event of a spillage.

7.6 Foul Water Drainage

7.6.1 The foul water for the development will discharge under gravity into the existing private manhole F103 to the south of the site.

8.0 Water Quality

8.1 Water Quality Overview

8.1.1 A key requirement of any SuDS system is that it protects the receiving water body from the risk of pollution. This can be effectively managed by an appropriate "train" or sequence of SuDS components that are connected in series.

8.1.2 The frequent and short duration rainfall events are those that are most loaded with potential contaminants (silts, fines, heavy metals and various organic and inorganic contaminants). Therefore, the first 5-10 mm of rainfall (first flush) should be adequately treated with SuDS.

8.1.3 The minimum number of treatment stages will depend on the sensitivity of the receiving water body and the potential hazard associated with the proposed development SuDS Manual (CIRIA, 2015).

8.1.4 The proposed development is a combination of very low (roof water) to low hazard (runoff from small car parking areas), as indicated on the table below:

Hazard	Source of Hazard	Present
Very Low	Residential Roof drainage.	**NO**
Low	Residential amenity uses including low usage car parking spaces and roads, other roof drainage	**NO**
Medium	Commercial, industrial uses including car parking spaces and roads (excluding low usage road, trunk roads and motorways)	**YES**
High	Areas used for handling and storage of chemicals and fuels, handling of storage and waste	**YES**

8.1.5 The site does lie within a source protection zone and therefore additional treatment stages are required.

8.1.6 The treatment processes provided by different SuDS components will have varying capabilities for removal of different types of contaminants as per the table below:

Hazard	Requirements for discharge to surface water and groundwater	Present
Very Low	Removal of gross solids and sediments only.	**YES**
Low	Simple index approach	**YES**
Medium	Surface water: Simple index approach Ground water: Simple index approach and risk screening	**YES**
High	Guidance and risk assessment process in HA (2009). Discharge may require environmental permit or licence. Obtain pre-permitting advice from environmental regulator. Risk assessment likely to be required.	**NO**

8.2 Simple Index Approach

8.2.1 The index approach as defined by CIRIA C753 (the SuDS Manual) defines the index approach to water quality in three steps as defined in Box 26.2 below:

BOX 26.2 Steps of the simple index approach

Step 1 – Allocate suitable pollution hazard indices for the proposed land use

Step 2 – Select SuDS with a total pollution mitigation index that equals or exceeds the pollution hazard index

Step 3 – Where the discharge is to protected[1] surface waters or groundwater, consider the need for a more precautionary approach

Note:

1 Designated as those protected for the supply of drinking water (Table 4.3).

8.3 Step 1- Allocate Potential Hazards

8.3.1 To deliver adequate treatment, the selected SuDS components should have a total pollution mitigation index (for each contaminant type) that equals or exceeds the pollution hazard index (for each contaminant type):

Total SuDS mitigation index ≥ pollution hazard index

(for each contaminant type) (for each contaminant type)

8.3.2 Where the only destination of the runoff is to a surface water – that is there is no infiltration from the SuDS to groundwater – the surface water indices should be used.

8.3.3 In England and Wales, where the principal destination of the runoff is to a surface water, but small amounts of infiltration may occur from unlined components (Interception), then the groundwater indices should be used for the discharge to groundwater, and the surface water indices should be used for the main surface water discharge (as suggested in Table 26.3).

8.3.4 Where the principal destination of the runoff is to groundwater, but discharges to surface waters may occur once the infiltration capacity is exceeded, the groundwater indices should be used, as suggested in Table 26.4. The risk to surface waters will be low, as dilution will be high for large events, so treatment is not required.

8.3.5 The pollution indices for this site have been selected using the guidance in CIRIA C753 and are as per Table 26.2 below:

TABLE 26.2 Pollution hazard indices for different land use classifications

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/ industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways[1]	Medium	0.7	0.6	0.7
Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways[1]	High	0.8[2]	0.8[2]	0.9[2]

Notes

1 Motorways and trunk roads should follow the guidance and risk assessment process set out in Highways Agency (2009).

2 These should only be used if considered appropriate as part of a detailed risk assessment – required for all these land use types (Table 4.3). When dealing with high hazard sites, the environmental regulator should first be consulted for pre-permitting advice. This will help determine the most appropriate approach to the development of a design solution.

Where a site land use falls outside the defined categories, the indices should be adapted (and agreed with the drainage approving body) or else the more detailed risk assessment method should be adopted.

Where nutrient or bacteria and pathogen removal is important for a particular receiving water, equivalent indices should be developed for these pollutants (if acceptable to the drainage approving body) or the risk assessment method adopted.

8.3.6 The identified hazard levels are as follows:

- Total Suspended Solids (TSS) 0.70
- Metals 0.60
- Hydrocarbons 0.70

8.3.7 Treatment has been provided in the form of catchpit manholes to remove sediment and contaminated particles and geotextiles within the porous paving as a filter medium.

8.3.8 Runoff generated within the commercial yard will drain to a linear drainage channel and into an existing petrol interceptor to the north of the site before discharging into the landscaping swale.

8.4 Treatment with Discharge to Surface Water

8.4.1 As the site is discharging to a watercourse or sewer, Table 26.3 of the CIRIA C753 manual is used to evaluate the water quality mitigation measures offered by the proposed drainage system.

TABLE 26.3 Indicative SuDS mitigation indices for discharges to surface waters

	Mitigation indices[1]		
Type of SuDS component	**TSS**	**Metals**	**Hydrocarbons**
Filter strip	0.4	0.4	0.5
Filter drain	0.4[2]	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond[4]	0.7[3]	0.7	0.5
Wetland	0.8[3]	0.8	0.8
Proprietary treatment systems[5,6]	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.		

Notes

1 SuDS components only deliver these indices if they follow design guidance with respect to hydraulics and treatment set out in the relevant technical component chapters.

2 Filter drains can remove coarse sediments, but their use for this purpose will have significant implications with respect to maintenance requirements, and this should be taken into account in the design and Maintenance Plan.

3 Ponds and wetlands can remove coarse sediments, but their use for this purpose will have significant implications with respect to the maintenance requirements and amenity value of the system. Sediment should normally be removed upstream, unless they are specifically designed to retain sediment in a separate part of the component, where it cannot easily migrate to the main body of water.

4 Where a wetland is not specifically designed to provide significantly enhanced treatment, it should be considered as having the same mitigation indices as a pond.

5 See Chapter 14 for approaches to demonstrate product performance. A British Water/Environment Agency assessment code of practice is currently under development that will allow manufacturers to complete an agreed test protocol for systems intended to treat contaminated surface water runoff. Full details can be found at: **http://tinyurl.com/qf7yuj7**

6 SEPA only considers proprietary treatment systems as appropriate in exceptional circumstances where other types of SuDS component are not practicable. Proprietary treatment systems may also be considered appropriate for existing sites that are causing pollution where there is a requirement to retrofit treatment. SEPA (2014) also provides a flowchart with a summary of checks on suitability of a proprietary system.

8.4.2 The identified hazard remediation levels are as follows:

	Hazard	Treatment	Result
– Total Suspended Solids (TSS)	0.70	0.70	0
– Metals	0.60	0.60	0
– Hydrocarbons	0.45	0.70	0

9.0 Ownership Responsibility

9.1.1 The drainage ownership responsibility has been outlined below.

Drainage Element	Ownership	Adopted
Private Surface Water system *	Maintenance company appointed by Hayling Island Builders Ltd	Private
Private / Residential Foul Water System *	Maintenance company appointed by Hayling Island Builders Ltd	Private
Sustainable drainage features	Maintenance company appointed by Hayling Island Builders Ltd	Private
Riparian Foul Plot Drainage	Property Owner	Private
Riparian Surface Water Plot Drainage	Private Owner	Private

***Note*:** Predominately two units or more

10.0 Drainage Maintenance

10.1.1 Regular inspection and maintenance is particularly important to ensure the effective long-term operation of surface water drainage, sewers and sustainable drainage systems (SuDS).

10.1.2 When designing, we have considered the required maintenance over the design life of the project, ensuring sufficient and permanent access to all areas of the system.

10.1.3 Maintenance operations can be divided into the following categories:

- Regular (or routine frequent) - this covers items that are carried out typically with a frequency from monthly to annually. It includes item such as inspection and monitoring, litter removal, grass cutting or other vegetation management, sweeping permeable pavements.
- Infrequent (or routine infrequent) - this covers items that are required typically with a frequency from annually up to 25 years (or possibly greater). It includes items such as wetland vegetation management, silt removal from swales, ponds or wetlands, scarifying and spiking infiltration basins and gravel replacement to filter drains.
- Remedial (or reactive) - this covers maintenance that is not usually required, but may be necessary as a result of vandalism, accidental damage, rainfall that exceeds the design capacity or similar events. Examples include repair of erosion in a swale or repair of permeable surfaces blocked for example by mixing concrete on them.

10.2 Riparian Responsibility

10.2.1 If an occupier owns land adjoining, above or with a portion of the drainage system running through it, they have certain rights and responsibilities. In legal terms they are a 'riparian owner'. If they rent the land, they should agree with the owner who will manage these rights and responsibilities.

10.2.2 It is recommended that the owner's appointed Management Company handle the maintenance of all underground drainage and all SuDS devices, with the following exceptions:

- Inspecting and cleaning out any surface mounted hard drainage systems (such as channel drains);
- Inspecting and cleaning out (or reporting) SuDS systems on a small scale (such as garden ditches and swales).

10.3 **Allowing for Replacement**

10.3.1 The design life of some SuDS elements and drainage elements of the proposed system is shorter than the predicted design life of the development. Therefore, the design and maintenance regime consider any potential replacement works (such as replacing permeable paving).

10.3.2 Regular inspection of the underground drainage system should be as per the tables below.

Operation and maintenance requirements for Surface Water and Foul Systems		
Maintenance Schedule	**Required Action**	**Typical Frequency**
Regular Maintenance	Inspect for sediment and debris in catchpit manholes and gullies. Clean out as required	Twice Annually
	Cleaning of gutters and any filters on downpipes	Annually (or as required based on inspections)
	Trimming any roots that may be causing blockages	Annually (or as required)
Occasional Maintenance	Remove sediment and debris from catchpits, gullies, attenuation devices and inside of concrete manhole rings	As required, based on inspections
Remedial Actions	Reconstruct and/or replace components, if performance deteriorates or failure/blockage occurs	As required
	Replacement of clogged components (flow restriction)	As required
Monitoring	Inspect silt traps/gullies/catchpits and note rate of sediment accumulation	Monthly in the first year and then annually
	Check flow control chamber and attenuation devices	Annually

11.0 Suds Maintenance

11.1.1 Like all drainage systems, SuDS components should be inspected and maintained. This ensures efficient operation and prevents failure. Usually SuDS components are on or near the surface and most can be managed using landscape maintenance techniques.

11.1.2 For below-ground SuDS such as permeable paving the manufacturer or designer should provide maintenance advice. This should include routine and long-term actions that can be incorporated into a maintenance plan.

11.1.3 The design process considers the maintenance of the components (access, waste management etc.) including any corrective maintenance to repair defects or improve performance.

11.1.4 In the absence of legislation funding for the adopter to maintain their SuDS may need to be resolved at the start of the development process to ensure that either the local authority, a maintenance company, local residents or the water company have sufficient resources to maintain the system in the long-term.

11.1.5 Further information on maintenance can be found in The SUDS Manual (CIRIA publication C697), which has been used as a guide for this report.

11.1.6 The SuDS scheme is unlikely to be handed over for maintenance until all parties are confident that the scheme is constructed and performs as designed. An interim maintenance plan can be incorporated on larger or phased schemes.

11.1.7 Maintenance of SuDS drainage should be in accordance with the guidance presented in CIRIA Factsheet “Maintenance of SuDS” May 2017. A detailed maintenance plan for the scheme will be generated by the appointed owner/maintainer of the site or a selected maintenance company and this section is for guidance only.

Operation and maintenance requirements for Pervious Pavements		
Maintenance Schedule	**Required Action**	**Typical Frequency**
Regular Maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional Maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphospate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48 h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

12.0 Summary and Conclusions

12.1.1 Hayling Island Builders Limited is planning a proposed development on the site at Furniss Business Center, Furniss Way, Hayling Island, PO11 0FG.

12.1.2 Patrick Parsons has been instructed by Hayling Island Builders Limited, to produce a Drainage (SuDS) Strategy to support the Planning Application.

12.1.3 The surface water system will discharge into the existing drainage network currently serving Furniss Business Center, which then drains to a landscaping swale. Tanked permeable paving will be provided for the parking bays and then discharged via a 33mm orifice plate (1 l/s) into the existing ditch to the south west.

12.1.4 The foul water will discharge into the existing private foul sewer located within the site boundary to the south.

12.1.5 The report has demonstrated that the proposed drainage measures ensure that no property will be at risk of flooding if the development proceeds and that suitable means of surface water and foul drainage can be achieved for the proposed development.

Appendix A

Location Plan

PLANNING ONLY

This drawing is for the above approval only and is subject to Planning Approval. This drawing has been based on third party survey and scheme drawings. Do not scale from this drawing (LA Planning Dept. can scale the drawings). The Architect, Richard Silver (RS Design), owns the copyright in the drawings and documentation produced in the course of the project. The client named below has a licence to copy and use the drawings and documentation only for purposes related to the project named below at the stage noted above. No drawings or client details will be released to anyone other than the client, unless given written instruction for distribution.

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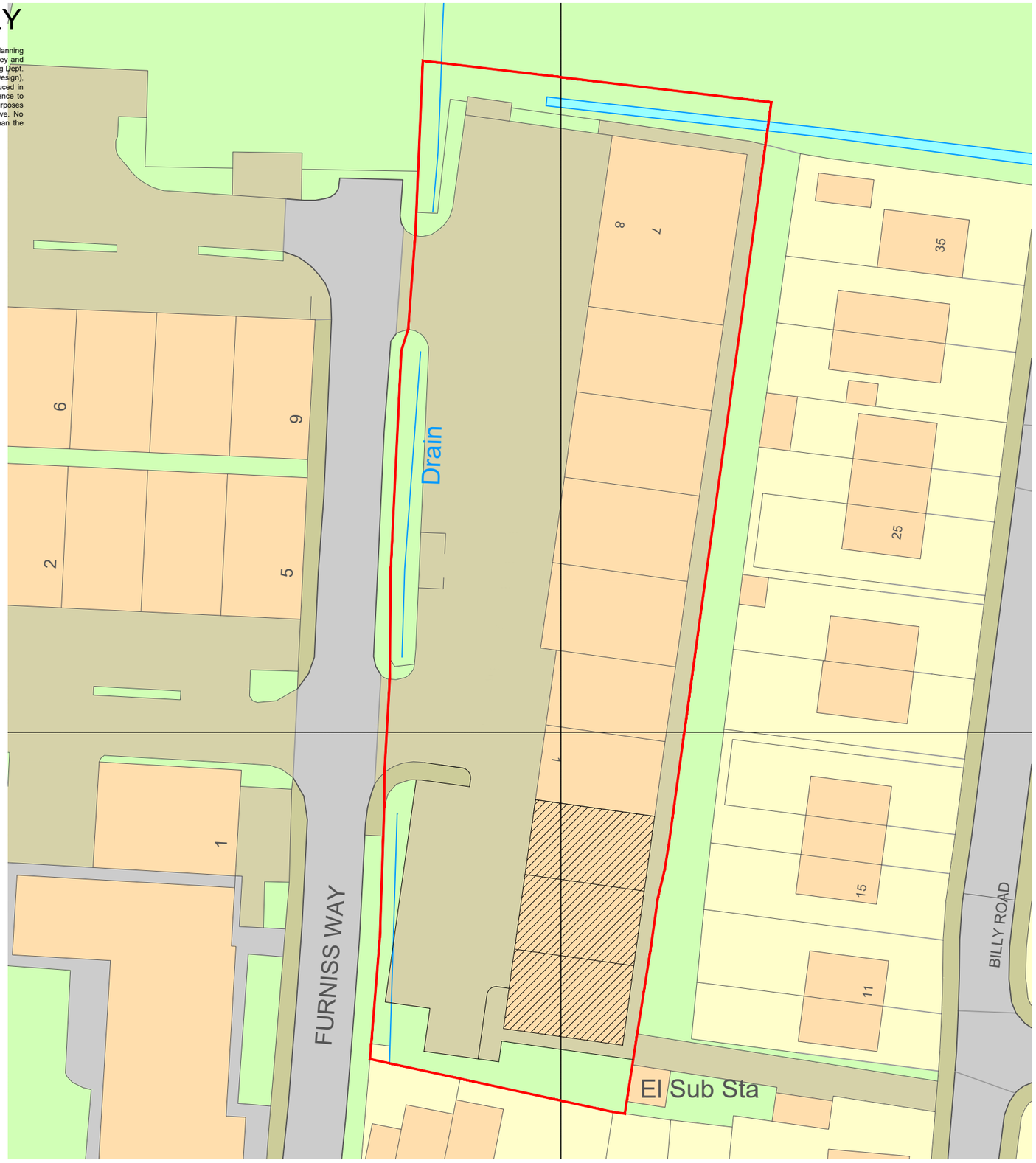

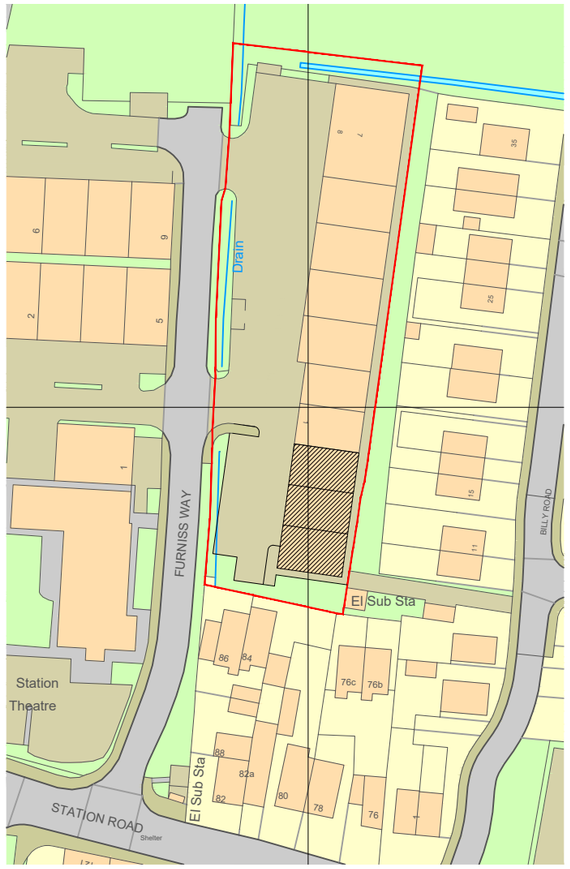

SITE LOCATION PLAN @ 1:1250

0m 50m

SITE LOCATION PLAN @ 1:500

0m 20m

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RS DESIGN
STUDIO 115 SURRENDEN ROAD BRIGHTON EAST SUSSEX BN1 6WB rs@rsdesign-architect.com

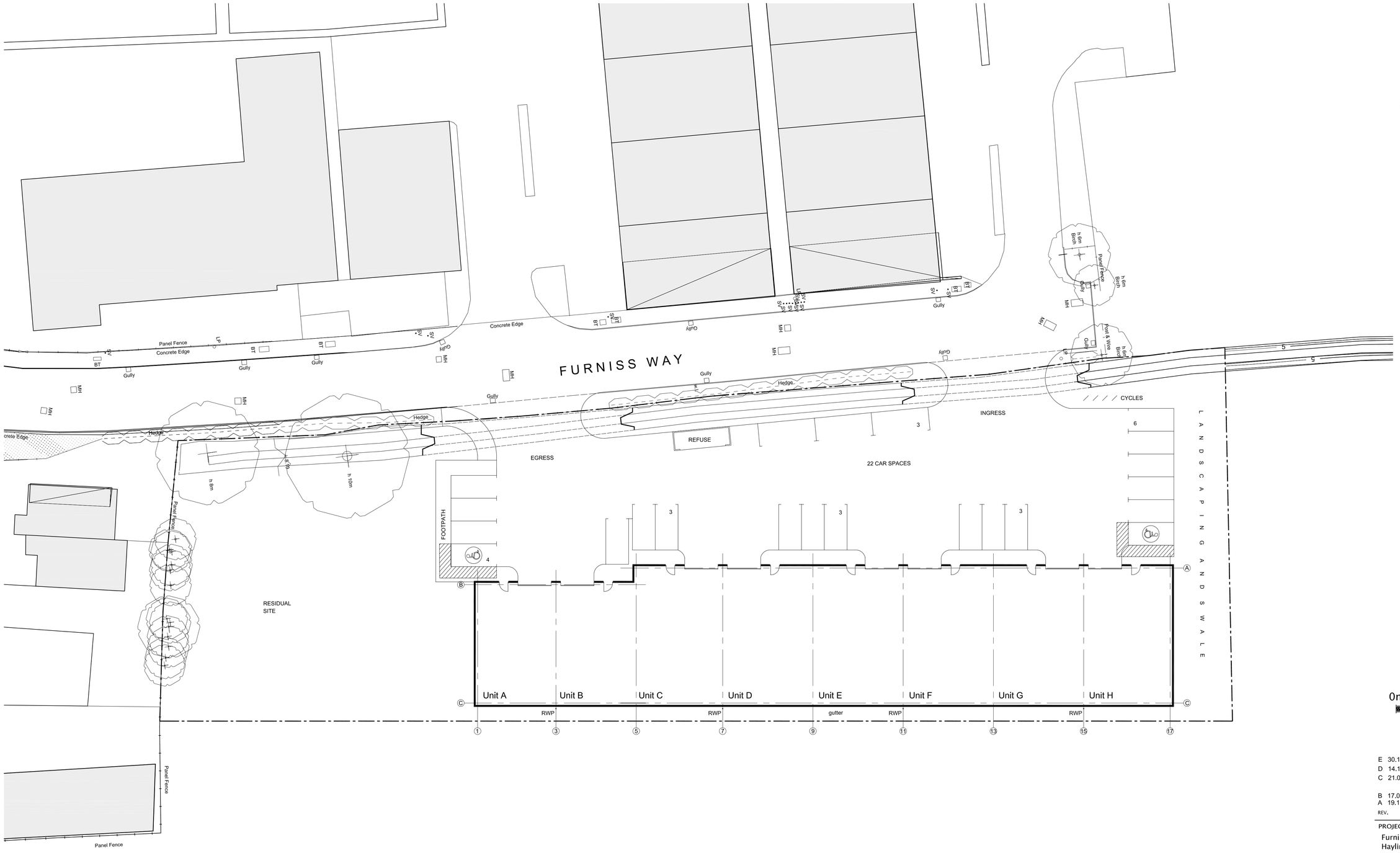
Furniss Way

CLIENT	PROJECT	DATE	DRAWN
Gillenden Developments Ltd.	Furniss Way	March 2022	RS
SCALE	**DRAWING**	**DRAWING NO**	**REV**
1:500 & 1:1250 @ A3	Site & Location plan as Proposed	22854 E 01	A

Appendix B

Existing Site Plan

SITE AREA – 3 790.6 m²
(0.937 Acres)



0m 2 5m 10m

REV.		
E	30.11.16	As built
D	14.10.16	Updated.
C	21.09.16	Footpaths revised. Cycles relocated. Hedge indicated.
B	17.08.16	Western yard line adjusted.
A	19.10.15	Updated.

PROJECT
Furniss Way
Hayling Island

Gillenden Developments Ltd.

DRAWING
Proposed Site Layout Plan

SCALE	PAPER SIZE	DATE	DRAWN BY
1:200	A1	26.05.15	

DRAWING N°	REVISION
147.01.04	E

CAD REF. drg 04 D proposed site layout plan.dwg

NOTES

1. Base drawing is topographic survey number 13063-13-01 with site boundaries provided by CSa environmental planning.
2. Refer to engineer details for new ingress and egress. Including retained ditch extent, new headwalls etc.
3. Ditto for new swale to northern boundary.

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Asheridge Road
Chesham, HP5 2PX
t 01494 776042

KE architecture (London) ltd

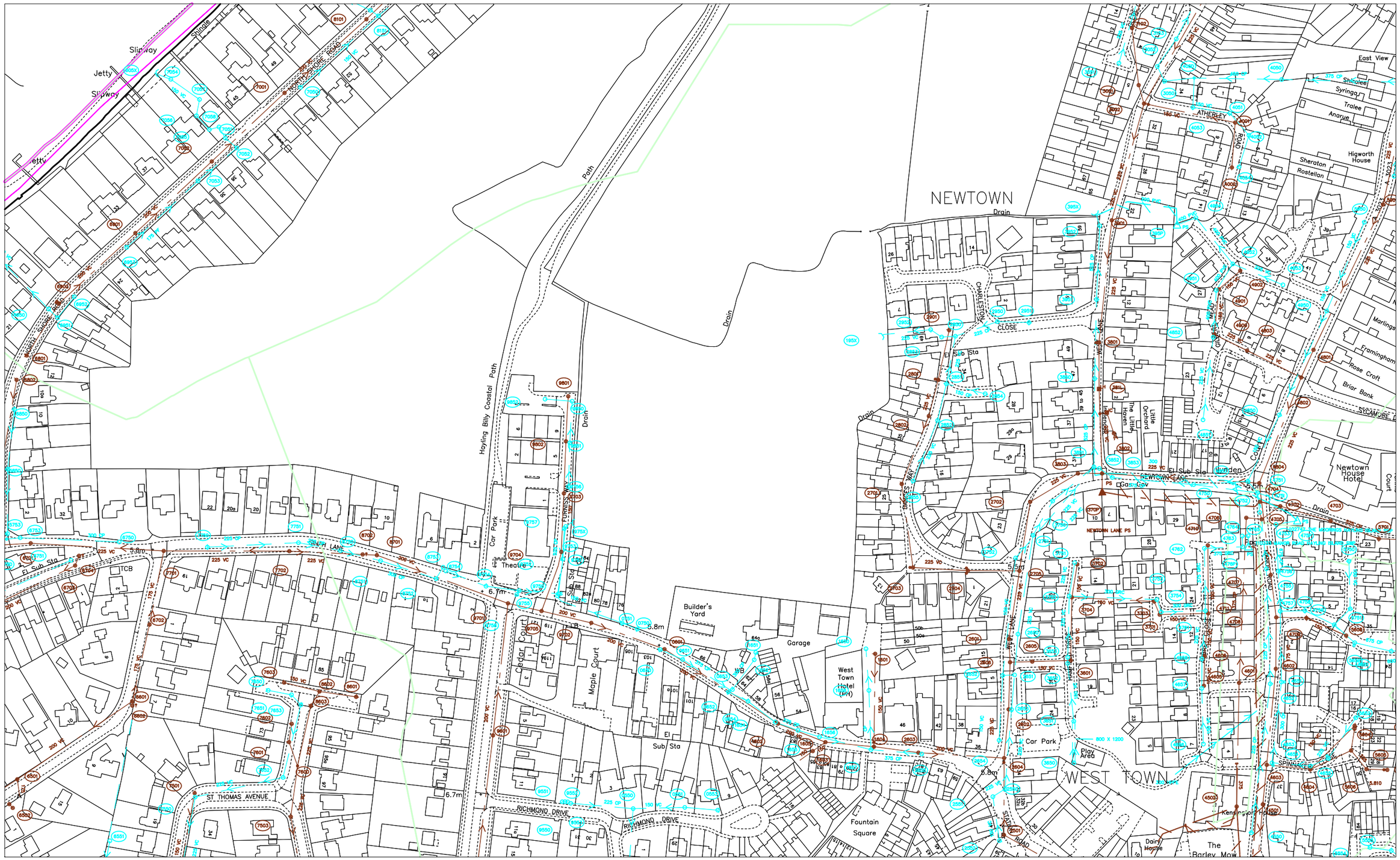
PATRICK PARSONS

Appendix C

Sewer Records

SEWER RECORDS PAGE 1 OF 2

100125



99547

470595

471539

O.S. REF. SZ7199NW	Drawn by: wrennl	The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determnined on site. WARNING: BAC pipes are constructed of Bonded Asbestos Cement WARNING: Unknown (UNK) materials may Include Bonded Asbestos Cement
	Scale: 1:2500	
Title: 151440-Land at Station Road	Date: 04/04/2013	Based upon Ordnance Survey Digital Data with the permission of the controller of H.M.S.O. Crown Copyright Reserved Licence No. WU 298530.

N

Southern Water

SEWER RECORDS PAGE 2 OF 2

Node	Cover	Invert	Size	Material	Shape	
0550X	4.57	3.02	150	VC	CIRC	
0551X			150	VC	CIRC	
0553X	5.73	4.5	150	VC	CIRC	
0601X	5.84	3.48	200	VC	CIRC	
0650X	5.85	4.78	375	CP	CIRC	
0651X	5.83	4.76	375	CP	CIRC	
0652X	5.77	4.72	225	CP	CIRC	
0653X	5.82	4.78	300	CP	CIRC	
0654X	5.93	4.69	375	CP	CIRC	
0750X	5.98	5.27	150	VC	CIRC	
0751X	5.95	5.19	150	VC	CIRC	
1601X	6.08	4.3	150	VC	CIRC	
1602X	5.98	3.24	200	VC	CIRC	
1603X	5.71	3.13	200	VC	CIRC	
1604X	5.56	3.02	200	VC	CIRC	
1605X			150	UNK	CIRC	
1651X	6.02	4.82	300	CP	CIRC	
1652X	6.02	4.8	300	CP	CIRC	
1654X	5.98	4.67	375	CP	CIRC	
1655X	5.94	4.6	375	CP	CIRC	
1656X	5.79	4.58	375	CP	CIRC	
1657X	5.6	4.4	OTHER	CP	RECT	
1658X			OTHER	CP	RECT	
2501X	6.33	4.5	175	VC	CIRC	
2550X	6.03	5.13	225	VC	CIRC	
2551X	6.07	5.39	225	VC	CIRC	
2552X	6.35	5.49	150	VC	CIRC	
2601X	5.78	2.58	225	VC	CIRC	
2602X	5.68	2.72	225	VC	CIRC	
2603X	5.73	2.99	200	VC	CIRC	
2604X	5.87	2.81	225	VC	CIRC	
2605X	5.8	2.81	150	VC	CIRC	
2606X	5.73	2.63	225	VC	CIRC	
2650X	5.55		225	VC	CIRC	
2651X			UNK	UNK	CIRC	
2652X	5.79		150	VC	CIRC	
2653X	5.56		225	VC	CIRC	
2654X	5.72		150	VC	CIRC	
2655X	5.75	4.8	375	CP	CIRC	
2701X	5.43	3.72	225	VC	CIRC	
2702X	5.31	2.34	225	VC	CIRC	
2703X	5.68	3.48	225	VC	CIRC	
2704X	5.68	3.3	225	VC	CIRC	
2705X	5.58	2.44	225	VC	CIRC	
2751X	5.46	4.53	225	VC	CIRC	
2752X	5.62	4.63	225	VC	CIRC	
2801X	5.85	3.95	225	VC	CIRC	
2802X	5.69	3.84	225	VC	CIRC	
2850X	5.75	4.34	225	VC	CIRC	
2851X	5.74	4.45	225	VC	CIRC	
2852X	5.79	4.59	225	VC	CIRC	
2853X	5.6	4.22	225	VC	CIRC	
2854X	5.73	4.78	150	CP	CIRC	
2855X	5.38	4.74	225	VC	CIRC	
2901X	5.58	4.1	225	VC	CIRC	
2950X	5.62	4.62	225	CP	CIRC	
2951X	5.55	4.7	225	CP	CIRC	
2952X	5.54	4.18	225	VC	CIRC	
3001X			150	VC	CIRC	
3002X	5.1	0.83	225	VC	CIRC	
3050X	5.09	3.87	450	CP	CIRC	
3051X	5.04	4.05	225	VC	CIRC	
3052X	5.19	3.84	450	CP	CIRC	
3102X	4.83	3.43	150	VC	CIRC	
3153X	5.09	3.82	450	CP	CIRC	

Node	Cover	Invert	Size	Material	Shape	
350ZX			200	CI	CIRC	
3601X	6.17	3	150	VC	CIRC	
3650Y	7.02	5.15	UNK	GRC	CIRC	*
3650X	7.02	5.15	UNK	GRC	CIRC	*
3651X	6.76	4.92	150	VC	CIRC	
3652X	6.17	4.68	225	VC	CIRC	
3653X	6.16	4.65	225	VC	CIRC	
3701X	5.99	4.07	150	VC	CIRC	
3702X	5.75	3.81	150	VC	CIRC	
3703X	5.94	4	150	VC	CIRC	
3704X	5.9	3.28	150	VC	CIRC	
370PX			225	CI	CIRC	
3750X	5.29	4.48	225	VC	CIRC	
3751X	5.76	4.37	225	VC	CIRC	
3752X	5.87	4.12	300	GRC	CIRC	
3753X	5.91	3.76	300	GRC	CIRC	
3754X	5.99	3.74	300	GRC	CIRC	
3801X	5.17	0.48	225	VC	CIRC	
3802X	5.3		375	CP	CIRC	
3803X	5.3	2.2	225	VC	CIRC	
3804X			150	VC	CIRC	
3805X			150	VC	CIRC	
380DX			225	VC	CIRC	
381LX	5.27	0.45	225	VC	CIRC	
3850X	5.16	4.1	525	CP	CIRC	
3851X	5.36	4.19	525	CP	CIRC	
3852X	5.3	4.21	450	CP	CIRC	
3853X	5.11	4.26	525	CP	CIRC	
3901X	4.93	0.63	225	VC	CIRC	
3951X	4.92	3.98	525	CP	CIRC	
3952X	5.11	3.83	525	CP	CIRC	
395PX			200	PVC	CIRC	
4001X	5.36	3.16	150	VC	CIRC	
4002X	5.44	3.48	150	VC	CIRC	
4050X	5.54	4.44	450	CP	CIRC	
4051X	5.43	4.64	150	VC	CIRC	
4052X	5.49		150	VC	CIRC	
4053X	5.25	4.58	150	VC	CIRC	
4054X	5.48	4.86	150	VC	CIRC	
405DX			450	CP	CIRC	
4501Y	6.5		175	VC	CIRC	*
4501X	6.5	4.69	225	VC	CIRC	*
4502X	6.66		375	CP	CIRC	
4550X	6.68	5.61	225	CP	CIRC	
4601X	6.48	4.83	375	CP	CIRC	
4602X	6.14	4.34	175	VC	CIRC	
4603X	6.43		225	UNK	CIRC	
4604X	6.64		225	VC	CIRC	
4605X	6.46	4.8	150	VC	CIRC	
4606X	6.33	4.6	150	VC	CIRC	
460ZX			375	UNK	CIRC	
4651X	6.39	3.98	300	VC	CIRC	
4652X	6.13	4.96	225	CP	CIRC	
4653X	6.38	4.17	300	CP	CIRC	
4654X	6.64	4.28	300	CP	CIRC	
4655X	6.73	4.39	300	CP	CIRC	
4656X	6.68	5.22	150	VC	CIRC	
4657X	6.48	4.51	150	VC	CIRC	
4658X	6.35	4.25	225	VC	CIRC	
4702X	5.97	4.32	525	CP	CIRC	
4703X	6.27	4.31	525	CP	CIRC	
4704X			525	CP	CIRC	
4705X	5.71	4.41	375	CP	CIRC	
4706X	6.14	4.51	375	CP	CIRC	
4707X	5.99	4.1	175	VC	CIRC	

Node	Cover	Invert	Size	Material	Shape	
4708X	6.1	4.25	175	VC	CIRC	
4709X	6.24	4.75	150	VC	CIRC	
4710X	6.12	4.74	150	VC	CIRC	
4711X	6.16	4.28	150	VC	CIRC	
4750X	5.57	4.31	375	CP	CIRC	
4751Y	5.77	4.64	225	VC	CIRC	*
4751X	5.77	4.47	375	CP	CIRC	*
4752Y	5.72	4.6	375	CP	CIRC	*
4752X	5.72	4.57	225	VC	CIRC	*
4753X	5.96		675	CP	CIRC	
4755X	6.06	3.38	675	CP	CIRC	
4756X	5.91	4.66	225	CP	CIRC	
4757X	6.17	3.44	675	CP	CIRC	
4758X	6.31	3.49	675	CP	CIRC	
4759X	6.4	3.51	675	CP	CIRC	
475IX		4.65	375	CP	CIRC	
4761X	6.15	3.59	375	GRC	CIRC	
4762X	6.09	3.5	375	GRC	CIRC	
4763X	6.057	3.241	375	GRC	CIRC	
4764X	5.97	3.23	450	CP	CIRC	
4765X	5.917	3.22	375	GRC	CIRC	
476PX	6.126	3.22	300	UNK	CIRC	
4801X	5.8	2.64	225	VC	CIRC	
4802X	5.75	2.57	225	VC	CIRC	
4803X	5.63	2.91	225	VC	CIRC	
4804X	5.79	2.49	225	VC	CIRC	
4850X	5.82	4.64	150	VC	CIRC	
4851X	5.47	4.34	225	VC	CIRC	
4852X			400	PVC	CIRC	
4853X	5.67	4.53	225	VC	CIRC	
4900X			225	VC	CIRC	
4901X	5.23	3.22	150	VC	CIRC	
4902X	5.28	3.41	150	VC	CIRC	
4950X	5.79	4.92	150	VC	CIRC	
4951X			400	PVC	CIRC	
4952X	5.29	3.71	400	PVC	CIRC	
4953X		4.12	225	VC	CIRC	
4954X			400	PVC	CIRC	
5554X	7.17	5.17	225	VC	CIRC	
5555X	7.25	5.04	225	VC	CIRC	
5604X		5.208	150	UNK	CIRC	
5605X			225	UNK	CIRC	
5606X			225	UNK	CIRC	
5607X			225	UNK	CIRC	
5608X	6.42	5.03	150	VC	CIRC	
5610X	6.4	5.48	150	VC	CIRC	
5650X	6.46	3.58	675	CP	CIRC	
5651X	6.18	3.6	675	CP	CIRC	
5652X	6.36	4.58	225	VC	CIRC	
5701X	6.27	4.31	525	CP	CIRC	
5750X	6.01	4.95	150	VC	CIRC	
5751X	6.22	4.3	150	VC	CIRC	
5753X	5.91	4.8	150	VC	CIRC	*
5753Y	5.91		UNK	UNK	CIRC	*
575DX			375	CP	CIRC	
5850X	5.97	4.97	150	VC	CIRC	
5901X	5.8	2.9	225	VC	CIRC	
5950X	5.86	5.11	150	VC	CIRC	
6501X	6.33	4.76	200	VC	CIRC	
6502X			UNK	UNK	CIRC	
6551X			450	CP	CIRC	
6601Y	6.7	5.04	175	VC	CIRC	*
6601X	6.7	5.04	200	VC	CIRC	*
6701X	5.78	3.5	225	VC	CIRC	
6702X	6.44	4.55	175	VC	CIRC	

Node	Cover	Invert	Size	Material	Shape	
6703X	5.61	4.29	200	VC	CIRC	
6704X			150	VC	CIRC	
6750X	60.03		300	CP	CIRC	
6751X	5.7		150	VC	CIRC	
6753X	5.89	4.85	OTHER	CO	RECT	
6801X	5.93	3.13	200	VC	CIRC	
6802X	6.04	3.79	200	VC	CIRC	
6850X	6.01	5.24	150	VC	CIRC	
6901X	5.68	2.83	200	VC	CIRC	
6902X	5.83	2.99	200	VC	CIRC	
6950X	6	4.76	150	VC	CIRC	
6951X	5.96	4.88	150	VC	CIRC	
6952X	5.94	5.14	150	VC	CIRC	
6953X	5.82	5.04	175	PF	CIRC	
7001X	5.28	2.37	200	VC	CIRC	
7002X	5.54	2.62	200	VC	CIRC	
7050X	5.29	4.49	150	VC	CIRC	
7051X	5.43	4.4	150	VC	CIRC	
7052X	5.54	4.56	150	VC	CIRC	
7053X	5.65	4.78	150	VC	CIRC	
7054X			150	VC	CIRC	
7055X			150	VC	CIRC	
7056X			150	VC	CIRC	
7057X			150	VC	CIRC	
7058X			150	VC	CIRC	
7501X	7.12	5.73	150	VC	CIRC	
7503X	7.39	5.86	225	VC	CIRC	
7550X	7.14	5.86	225	VC	CIRC	
7601X	7.48	6.66	100	VC	CIRC	
7602X	7.39	6.88	100	PVC	CIRC	
7603X	7.39	6.56	150	VC	CIRC	
760DX			225	VC	CIRC	
7650X	7.24	6.5	150	VC	CIRC	
7651X	7.42	6.44	150	VC	CIRC	
7652X	7.5	6.11	225	VC	CIRC	
7653X	7.39	6.26	150	VC	CIRC	
7701X	5.85	3.75	225	VC	CIRC	
7702Y	6.04		225	VC	CIRC	*
7702X	6.04	3.95	225	VC	CIRC	*
7750X	5.93	5.35	225	CP	CIRC	
7751X	5.94	5.16	225	CP	CIRC	
8101X	5.1	2.17	200	VC	CIRC	
8151X	5.19	4.06	150	VC	CIRC	
8152X	5.18	3.95	150	VC	CIRC	
8601X	7.24	6.53	150	VC	CIRC	
8602X	7.53	6.38	150	VC	CIRC	
8603X	7.39	6.28	225	VC	CIRC	
8701Y	6.04	4.96	200	VC	CIRC	
8702X			225	VC	CIRC	
8750X	5.91	4.97	225	CP	CIRC	
8751X	6.03	4.65	300	CP	CIRC	
8752X	5.99	4.54	300	CP	CIRC	
8754X	6.16	5.09	450	CP	CIRC	
9550X	6.55	5.33	100	VC	CIRC	
9551X	6.53	5.29	100	CP	CIRC	
9552X	6.53	5.27	100	CP	CIRC	
9553X	6.5	4.11	225	CP	CIRC	
9601X	6.54	4.35	200	VC	CIRC	
9701X	6.13	3.79	200	VC	CIRC	
9702X	5.96	3.62	200	VC	CIRC	
9703X	6.178	4.273	150	UNK	CIRC	
9704X	6.198	4.006	150	UNK	CIRC	
9705X	6.12	3.73	200	VC	CIRC	
9750X	6.41	5.01	450	CP	CIRC	
9751X	6.22	4.76	525	CP	CIRC	

LEGEND - SEWERS

LINE STYLES / COLOURS

- Brown: Foul; Foul Syphon Sewer; Foul Vacuum Main; Foul Rising Main
- Red: Combined; Combined Syphon Sewer; Combined Rising Main; Lateral Drain
- Orange: Building Over Agreement Area
- Dark Blue: Treated Effluent
- Purple: Sludge; Sewer Catchment; Section 104 Area
- Light Blue: Surface Water; Surface Water Rising Main
- Yellow: Private
- Green: Access Shaft; Decommissioned

MATERIALS

AK	Alkathene
BAC	Bonded Asbestos Cement
BRC	Brick (Common)
BRE	Brick (Engineering)
CC	Concrete Box Culvert
CI	Cast Iron
CO	Concrete (In-Situ)
CP	Concrete (Pre-Cast)
CSB	Concrete Segments (bolted)
CSU	Concrete Segments (unbolted)
DI	Ductile Iron
GRC	Glass Reinforced Concrete
GRP	Glass Reinforced Plastic
MAC	Masonry in regular Courses
MAR	Masonry in random Courses
PE	Polyethylene
PF	Pitch Fibre
PP	Polypropylene
PVC	Polyvinyl Chloride
RPM	Reinforced Plastic Matrix
SI	Spun Iron
ST	Steel
VC	Vitrified Clay
XXX	Other
ZZZ	Unknown

Manhole (SW); Manhole (F&C); Lamp hole (SW); Lamp hole (F&C); Pumping Station (SW); Pumping Station (F&C); Side entry manhole (SW); Side entry Manhole (F&C); Blind shaft (SW); Blind shaft (F&C); Ejector station (SW); Ejector station (F&C); Watertight door (SW); Watertight door (F&C); Flushing ch. Mn=e (SW); Flushing ch. Mn=e (F&C); Flushing ch. No=e (SW); Flushing ch. No=e (F&C); Demarcation Chamber

Washout (SW); Washout (F&C); Rodding Eye (SW); Rodding Eye (F&C); Gauging point (SW); Gauging point (F&C); Intercept chamber (SW); Intercept chamber (F&C); Storm Tank (SW); Storm Tank (F&C); Vortex chamber (SW); Vortex chamber (F&C); Label ellipse; Dummy/S24 manhole; Outfall; Penstock chamber; Damboards; Storm Overflow; Backdrop manhole

Other (s); Other; Change in sewer (s); Change in sewer; Reflux valve; Flap valve; Cascade; Anode; Valve; Closed Valve; Air Valve; Hatch box (SW); Hatch box (F&C); Direction arrow; Emptying valve; Catchpit; Soakaway; Inlet; Balancing Pond

Wastewater treatment works; Marine treatment works; Outfall headworks; Vent; Vent column; Tidal storage tank; Blank end; Head of Public Sewer; Micro Pumping Station

SHAPES (S)

A	Arched	R	Rectangular
B	Barrel	S	Square
C	Circular	T	Trapezoidal
E	Egg	U	U Shape
H	Horseshoe	X	Other

NODE REFERENCING SYSTEM

1st digit: hundred metre easting identifier
2nd digit: hundred metre northing identifier
3rd digit: sewer type identifier
0-4 = Foul/Combined
5-9 = Surface Water
4th digit: next sequential node

Drawn by:	wrennl
Title:	151440-Land at Station Road
Date:	04/04/2013

Southern Water

PATRICK PARSONS

Appendix D
Magic Map Geology Information

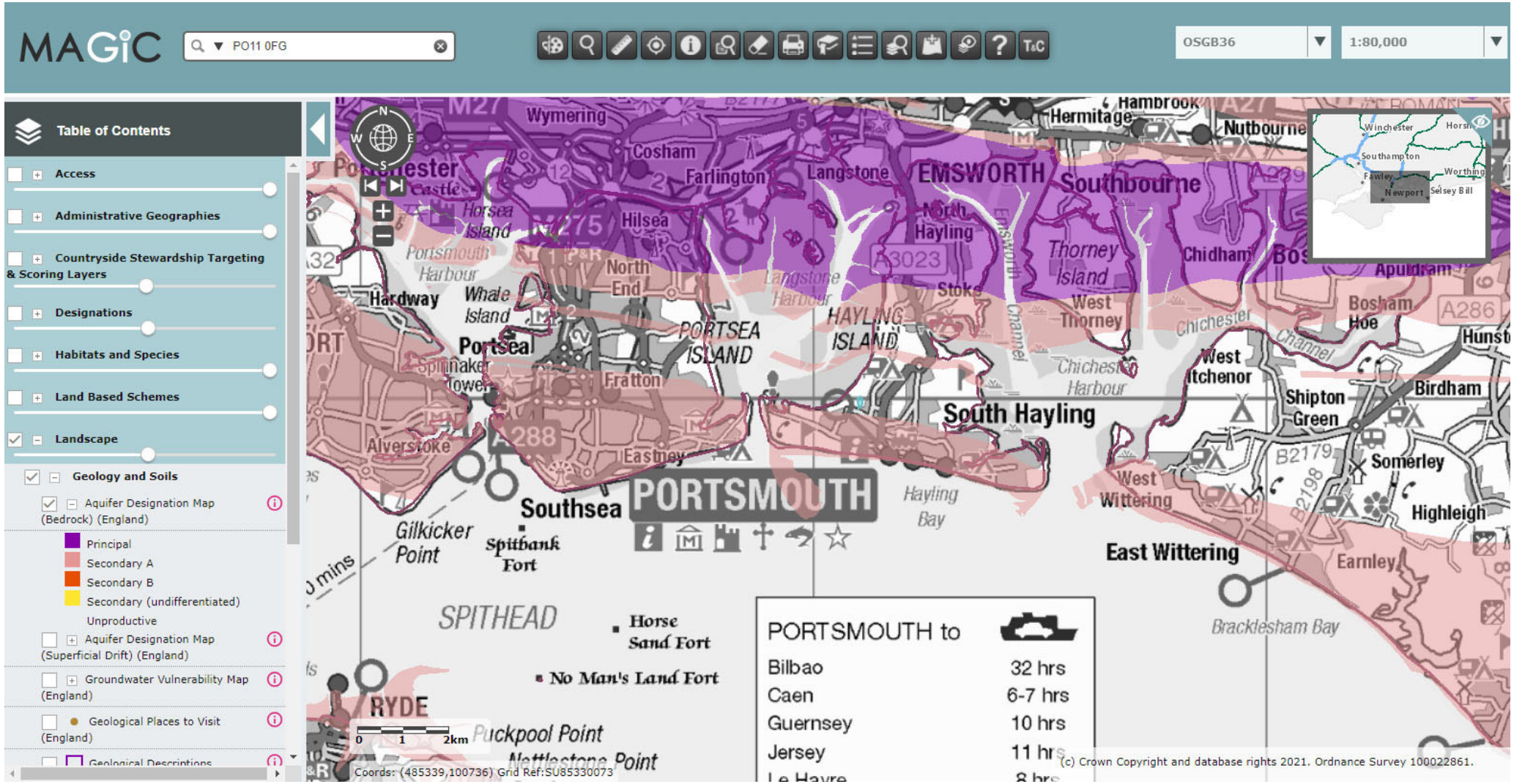

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Table of Contents
Access
Administrative Geographies
Countryside Stewardship Targeting & Scoring Layers
Designations
Habitats and Species
Land Based Schemes
Landscape
Geology and Soils
Aquifer Designation Map (Bedrock) (England)
Principal
Secondary A
Secondary B
Secondary (undifferentiated)
Unproductive
Aquifer Designation Map (Superficial Drift) (England)
Groundwater Vulnerability Map (England)
Geological Places to Visit (England)
Geological Descriptions
Wymering
Cosham
Farlington
Langstone
EMSWORTH
Southbourne
Hermitage
Nutbourne
Hilsea
North Hayling
Thorney Island
Chidham
Hardway
Whale Island
Portsea
PORTSEA ISLAND
HAYLING ISLAND
West Thorney
Bosham
Hoe
Fratton
South Hayling
West Itchenor
Shipton Green
Birdham
Alverstoke
Eastney
Southsea
PORTSMOUTH
Hayling Bay
West Wittering
Somerley
Highleigh
Gilkicker Point
Spitbank Fort
East Wittering
Earnley
SPITHEAD
Horse Sand Fort
No Man's Land Fort
Bracklesham Bay
RYDE
Puckpool Point
Nettlestone Point
PORTSMOUTH to
Bilbao 32 hrs
Caen 6-7 hrs
Guernsey 10 hrs
Jersey 11 hrs
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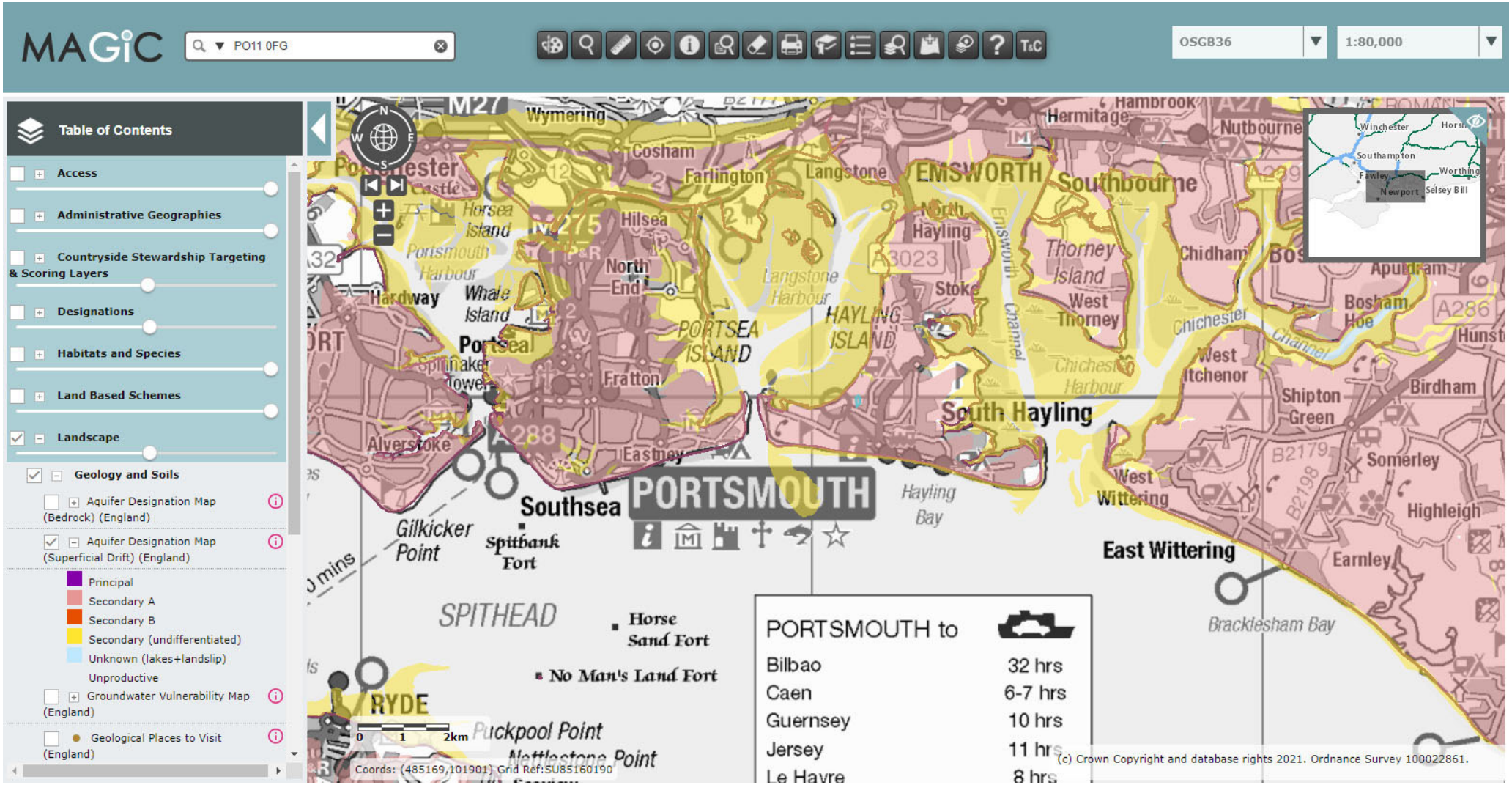
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OSGB36
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Table of Contents
Access
Administrative Geographies
Countryside Stewardship Targeting & Scoring Layers
Designations
Habitats and Species
Land Based Schemes
Landscape
Geology and Soils
Aquifer Designation Map (Bedrock) (England)
Aquifer Designation Map (Superficial Drift) (England)
Principal
Secondary A
Secondary B
Secondary (undifferentiated)
Unknown (lakes+landslip)
Unproductive
Groundwater Vulnerability Map (England)
Geological Places to Visit (England)
PORTSMOUTH
Southsea
Gilkicker Point
Spitbank Fort
SPITHEAD
Horse Sand Fort
No Man's Land Fort
RYDE
Puckpool Point
Nettlestone Point
Hayling Bay
East Wittering
Bracklesham Bay
Southbourne
EMSWORTH
Langstone
Farlington
Cosham
Wymering
Hilsea
North End
Fratton
Eastney
Alverstoke
Portsea
Hardway
Whale Island
Portsmouth Harbour
Horsea Island
PORTSEA ISLAND
HAYLING ISLAND
Langstone Harbour
North Hayling
Stoke
Thorney Island
West Thorney
Chichester Harbour
Chichester Channel
Emsworth Channel
South Hayling
West Wittering
West Itchenor
Chidham
Hermitage
Nutbourne
Hambrook
Apuldram
Bosham Hoe
Shipton Green
Birdham
Somerley
Highleigh
Earnley
Winchester
Southampton
Fawley
Worthing
Newport
Selsey Bill
PORTSMOUTH to
Bilbao 32 hrs
Caen 6-7 hrs
Guernsey 10 hrs
Jersey 11 hrs
Le Havre 8 hrs
0 1 2km
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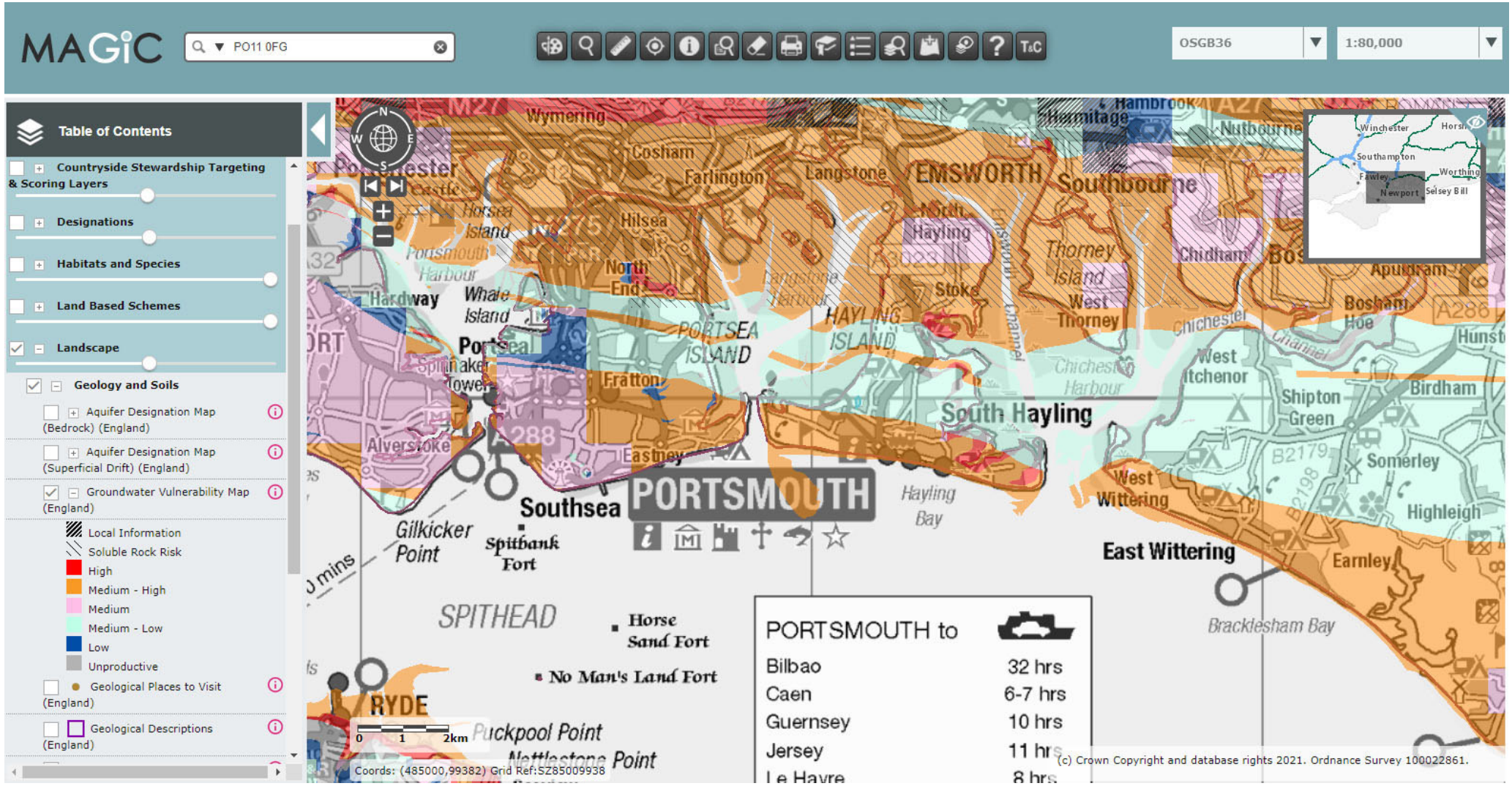
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Aquifer Designation Map (Bedrock) (England)
Aquifer Designation Map (Superficial Drift) (England)
Groundwater Vulnerability Map (England)
Local Information
Soluble Rock Risk
High
Medium - High
Medium
Medium - Low
Low
Unproductive
Geological Places to Visit (England)
Geological Descriptions (England)
PORTSMOUTH
Southsea
Gilkicker Point
Spitbank Fort
SPITHEAD
Horse Sand Fort
No Man's Land Fort
RYDE
Puckpool Point
Nettlestone Point
Hayling Bay
South Hayling
East Wittering
Brackleshamn Bay
PORTSEA ISLAND
HAYLING ISLAND
EMSWORTH
Southbourne
Portsmouth Harbour
Whale Island
Hardway
Portsea
Fratton
Eastney
Alverstoke
Hilsea
North End
Langstone
Farlington
Cosham
Wymering
Hermitage
Nutbourne
Chidham
Thorney Island
West Thorney
Stoke
Chichester Harbour
West Itchenor
Shipton Green
Birdham
Somerley
Highleigh
Earnley
West Wittering
Bosham Hoe
Apuldram
Winchester
Southampton
Fawley
Worthing
Newport
Selsey Bill
PORTSMOUTH to
Bilbao 32 hrs
Caen 6-7 hrs
Guernsey 10 hrs
Jersey 11 hrs
Le Havre 8 hrs
0 1 2km
Coords: (485000,99382) Grid Ref:SZ85009938
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Appendix E
Greenfield Runoff Calculations

ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.400
Area (ha)	0.090	Urban	0.000
SAAR (mm)	700	Region Number	Region 7

Results	**l/s**
QBAR Rural	0.3
QBAR Urban	0.3
Q100 years	1.0
Q1 year	0.3
Q30 years	0.7
Q100 years	1.0

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Appendix F

Proposed Site Plan

PLANNING ONLY

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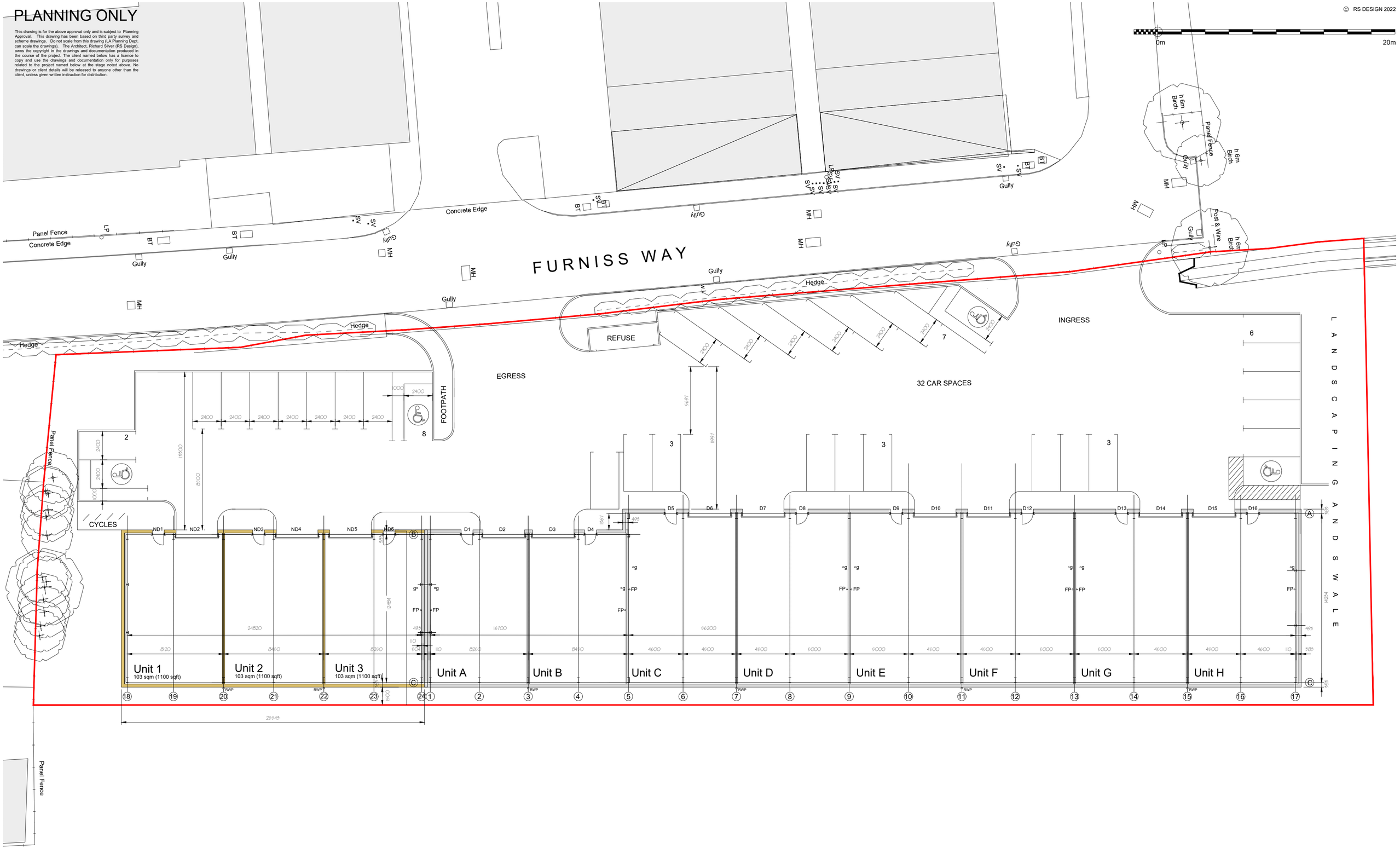


RS DESIGN

STUDIO 115 SURRENDEN ROAD BRIGHTON EAST SUSSEX BN1 6WB rs@rsdesign-architect.com

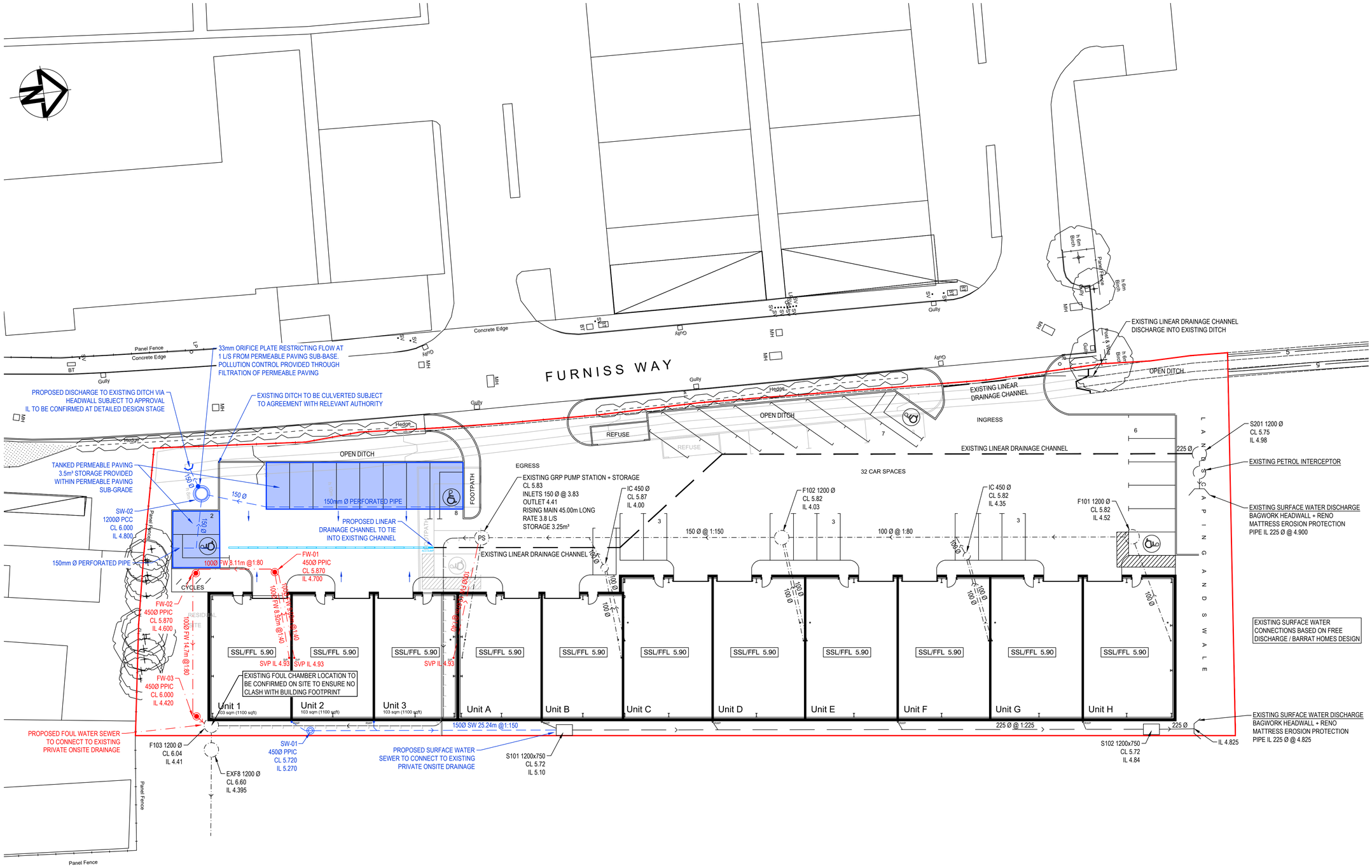
Furniss Way

CLIENT	PROJECT	DATE	DRAWN
Gillenden Developments Ltd.	Furniss Way	June 2022	RS
SCALE	DRAWING	DRAWING NO	REV
1:200 @ A2	Site plan as Proposed	22854 P 10	D

Appendix G

Proposed Drainage Strategy Layout

ORIGINAL SIZE A1



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1.5. ALL LEVELS IN METERS.
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LEGEND

- EXISTING PRIVATE FOUL WATER DRAINAGE
- EXISTING PRIVATE FOUL RISING MAIN
- EXISTING PRIVATE SURFACE WATER DRAINAGE
- FOUL WATER DRAIN WITH SIZE, GRADIENT, MATERIAL AND DIRECTION. DISTANCE AND DROP GIVEN BETWEEN CENTRES OF MH'S.
- STORM WATER DRAIN WITH SIZE, GRADIENT, MATERIAL AND DIRECTION. DISTANCE AND DROP GIVEN BETWEEN CENTRES OF MH'S.
- FW-PPIC SW-PPIC — POLYPROPYLENE INSPECTION CHAMBER WITH SIZE, COVER AND INVERT LEVELS.
- PRECAST CONCRETE MANHOLE WITH SIZE, COVER AND INVERT LEVELS.
- SVP — SOIL VENT DOWNPIPE
- RWP — RAIN WATER DOWNPIPE
- PROPOSED ACO CHANNEL.
- SITE BOUNDARY FROM ARCHITECTS DRAWING

REV.	REVISION NOTE/COMMENT					
P1	ISSUED FOR INFORMATION.					
	MK	25.05.23	DB	25.05.23	DB	25.05.23
	DRW BY	DATE	CCK BY	DATE	APP BY	DATE

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W. www.patrickparsons.co.uk

Client
HAYLING ISLAND BUILDERS LIMITED

Project
FURNISS BUSINESS CENTER, FURNISS WAY, HAYLING ISLAND

Drawing
PROPOSED DRAINAGE STRATEGY

Drawn	Date
MK	MAY 2023
Patrick Parsons Project No. 11648	Scale @ A1 1:200m

Status Description	Status
INFORMATION	S2
Drawing No. (project-originator-volume-level-type-role-number) FUR-PPC-XX-XX-DR-C-2221	Revision P1

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