Design and Access Statement (DAS)

DAS-001

Drummore, Drigg Road, Seascale, Cumbria, CA20 1NX

Full Planning Application Proposed Dormer Bungalow

12/10/2021 – Rev C

Document Control

Date	Issue Number	Change/Amendment	Author:
01-08-2021	First Issue	First Draft	
15-09-2021	Rev A	Full Plans submission following requirement for withdrawing outline planning application due to planning sensitive design requirments	
28-09-2021	Rev B	Amended following validation	
12-10-2021	Rev c	Amended following detailed discussion & email from CBC Planning	

Approval and Sign off

Project: Drummore, Drigg Road, Seascale, Cumbria, CA20 1NX

I have reviewed and approved the Design & Access Statement and all associated documentation for the Project named above, with changes, additions, deletions or corrections as annotated in the instructional designer's master copy.

I hereby give you approval to proceed with creating the drafts of all workbooks, scripts, and other course materials.

I also give my approval for you to invoice my department for satisfactory completion of the Design Plans milestone of this project.

I understand that further changes to the structure, objectives, or content of the course (aside from those specified in the designer's master copy) will likely result in a delay in the final delivery date and could result in additional costs.

A Design and Specification Author

…….	……	1st August 2021
Print	Sign	Date

B Design and Specification Approver

…….	……	1st August 2021
Print	Sign	Date

C Design and Specification Sponsor (Clients)

Mr John Gainford		
…….	……	1st August 2021
Print	Sign	Date

Contents

1. Introduction

This Planning Statement supports an Full planning application by John Gainford for a residential development at Drummore, Drigg Road, Seascale, this is an full planning application is for a dormer bungalow dwelling.

This Planning Statement provides a summary of all relevant information about the proposed development and assesses the proposal in relation to all relevant adopted policy and other policy guidance including emerging policy.

John is very committed to the delivery of this scheme at Drummore, Drigg Road, Seascale and has carried out extensive studies, surveys, consultations, outline planning applications and assessments, in order to create a deliverable, and sustainable residential development.

This Planning Statement is just one of a number of documents in addition to the planning drawings submitted in support of this application. The full list of supporting documents is as follows:

- Plans
- Design and access statement

2. Flood Risk

A floodplain is the area that would naturally be affected by flooding if a river rises above its banks, or high tides and stormy seas cause flooding in coastal areas.

There are two different kinds of area shown on the Flood Map. They can be described as follows: Dark blue shows the area that could be affected by flooding, either from rivers or the sea, if there were no flood defences.

This area could be flooded: from the sea by a flood that has a 0.5% (1 in 200) or greater chance of happening each year or from a river by a flood that has a 1% (1 in 100) or greater chance of happening each year.

Light blue shows the additional extent of an extreme flood from rivers or the sea. These outlying areas are likely to be affected by a major flood, with a 0.1%
(1 in 1000) or greater chance of occurring each year.

These two colours show the extent of the natural floodplain if there were no flood defences or certain other manmade structures and channel improvements.

Flood Defences

The purple line shows some of our flood defences built to protect against river floods with a 1% (1 in 100) chance of happening each year, or floods from the sea with a 0.5% (1 in 200) chance of happening each year, together with some, but not all, older defences and defences which protect against smaller floods. Flood defences that are not yet shown will be gradually added.

Hatched areas benefit from flood defences, in the event of a river flood with a
1% (1 in 100) chance of happening each year, or a flood from the sea with a 0.5%
(1 in 200) chance of happening each year. If the defences were not there, these areas would be flooded. Not all areas that benefit from flood defences are currently shown, but the map is regularly updated as we obtain further information from our studies.

Flood defences do not completely remove the chance of flooding, however, and can be overtopped or fail in extreme weather conditions.

The Flood Risk information was obtained from the Environment Agency website.
Refer to the Integra Site Specific Flood Risk Assessment for further detailed information.

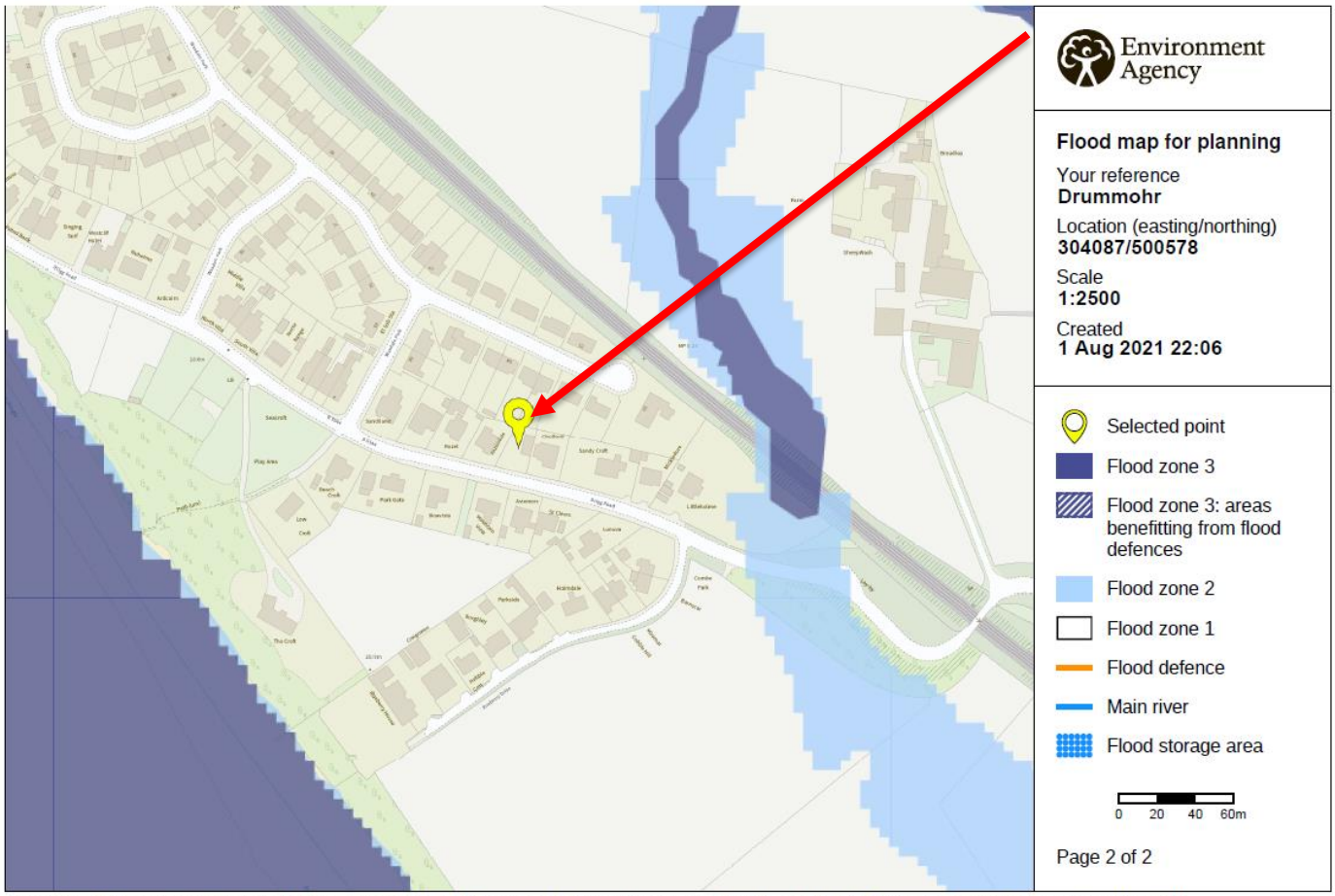

Fig 1 – Environment Agency Flood Maps

It can be seen from the above that the property falls outside the floor risk area and therefore is safe to develop, it should also be noted that this has not been known to have flooded over the recent period as Policy ENV1 – Flood Risk and Risk Management.

3. Use

The site is currently situated within the residential development boundary / area on a brownfield site within the Copeland Local Plan therefore, the proposed development of the site for residential use is considered appropriate.

The site is currently being used however historical land use was used as a commercial coal yard therefore classifying the site as brownfield (Policy SS2, ST2).

The proposed dwelling is proposed to provide a family home it is considered that the proposed development would accord with the aims of the Government & Copeland Borough Council Core Strategy and Development Management Policies as set out in line with the following;

- Policy ST1 – Strategic Development Principles
- Policy ST2 – Spatial Development Strategy
- Policy SS2 – Sustainable Housing Growth
- Policy SS4 – Community and Cultural Facilities and Services
- Policy ENV1 – Flood Risk and Risk Management
- Policy ENV5 – Protecting and Enhancing the Borough's Landscapes
- Policy SS2 – Sustainable Housing Growth
- Policy SS3 – Housing Needs, Mix and Affordability
- Policy DM10 – Achieving Quality of Place).
- Policy DM11 – Sustainable Development Standards
- Policy DM12 – Standards for New Residential Developments
- Policy DM14 – Residential Establishments
- Policy DM22 – Accessible Developments
- Policy DM24 – Development Proposals and Flood Risk
- Policy DM26 – Landscaping

Fig 2 - Copeland Borough Council Settlement Hierarchy

	Type and Scale of Development		
Classification	**Retail and Services**	**Employment**	**Housing**
Local Centre: Arlecdon/Rowrah; Beckermet; Bigrigg; Cleator; Distington; Frizington; Haverigg; Kirkland/ Ennerdale Bridge; Lowca/Parton; Moor Row; Moresby Parks; Seascale; St Bees; Thornhill	Convenience shopping to meet day-to-day needs, which could include farm shops or similar. Emphasis will be on retention of existing provision.	Emphasis will be on retention. Expansion potential may include tourism in some places, generally limited by environmental constraints. New provision most likely to be provided through conversion/ re-use of existing buildings or completion of sites already allocated.	Within the defined physical limits of development as appropriate. Possible small extension sites on the edges of settlements. Housing to meet general and local needs. Affordable housing and windfall sites.

Implications	Policy reference
The housing policies are all about encouraging an improvement in general housing standards together with an appropriate mix of types and tenures in new allocations. As a main Local Centre, Seascale would expect to accommodate somewhere between 50 – 100 new dwellings during the plan period. This would assist the maintenance and even expansion of community facilities and services locally as per SS4.	SS1 Improving the Housing Offer; SS2 Sustainable Housing

Brownfield Land: *Land that has been previously developed and is or was occupied by a permanent structure (excluding agricultural or forestry buildings), and associated fixed surface infrastructure. The definition includes the curtilage of the development. The definition is set out in the NPPF.*

Spatial Portrait

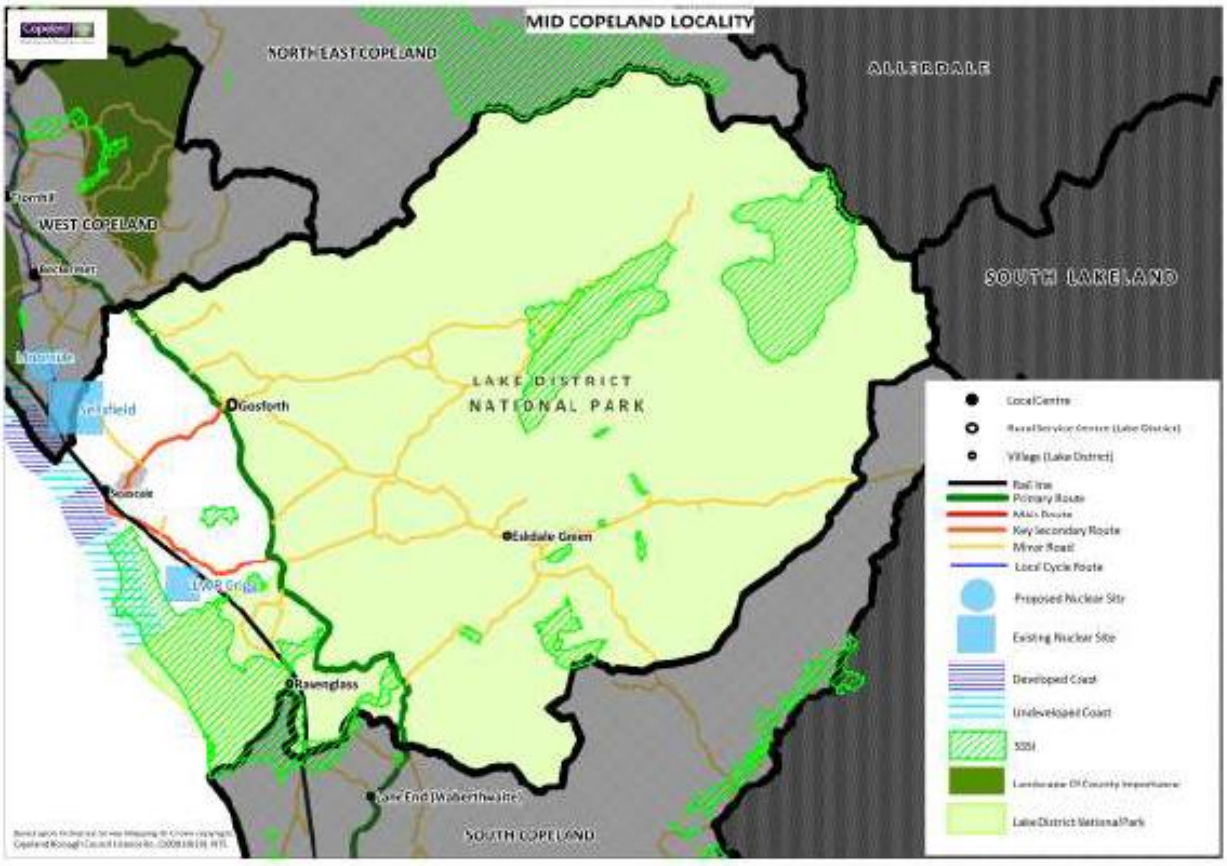

Fig 3 –Seascale falls under the "Mid Copeland Spatial Portrait"

Fig 4 – Settlement Boundary

4. Appearance

Fig 5 - Google map highlighting the area

5. The Drigg Road Vernacular

Drigg Road area has created its built form naturally with growth varying from modern new builds to traditional 1940's and everything in between. to suit the areas domestic or commercial needs, there are several different styles in the vicinity from detached, semi-detached, terraced, single & two storey properties.

There is no traditional set architectural style of Drigg Road or the immediate area, however the design, scale and massing of the property has be been carefully considered to be syphathetic with the adjacent properties (smaller in size, height, scale and using similar constructional materials)

- Roof – concrete flat tiles (to match adjacent property)
- Fascia & Soffits – Black finish UPVC (to match adjacent property)
- External Walls – White K-Rend / cement render (to match adjacent properties)
- Windows & Doors – Black UPVC & Composite (to match adjacent property)
- Plot parking and footpaths – permeable setts – Marshall Tegulars (black) (to match adjacent property)
- Boundary walls – retain existing 900mm wall to front (retain existing)
- Rear and side boundary – 1800mm hit & miss timber fence not extending the building frontage
- Garden Area - Grassed (to match adjacent property)

We have created a gable fronted dormer as 5 out of the 8 dwellings on the row have gable on the frontage,

All dwellings on the row are cement rendered elevation (dash and smoth rendered)

6. Secured by Design

In relation to designing out crime, we have endeavoured to keep the existing wall that provides a defensible rear & side boundary (Policy DM10 – Achieving Quality of Place) with modern compliant doors and window locking systems to PAS 24 legislation that will be installed as standard, the plot is provided with natural overlooking via rear and adjacent properties.

7. Energy Efficiency

We can confirm that the following design principles will be adopted for the development to reduce the thermal conductivity with the aid of modern insulation materials, reduced thermal bridging and improved air tightness of the dwelling, supplemented by a highly efficient energy source.

Using these principles for the dwelling design, Summary of the energy efficient construction of the dwelling: -

- Ground Floor – Concrete Slab with PUR insulation and screed achieving a U-Value of 0.20W/m2K
- External Walls – Cavity Wall with 100mm PUR insulation solid wall achieving a U-Values of 0.22 W/m2K
- Roof – 150mm PIR between and 50mm PIR under - 400mm mineral fibre insulation quilt to flat ceilings areas and 150mm PIR between and 40mm PIR under rafters to sloping areas to achieving a U-Value of 0.09 W/m2K
- Windows – PVCU, double glazed, low e coating and argon filled achieving a U-Value of 0.12 W/m2K
- Doors – Composite external doors construction achieving a U Value of 1.2 W/m2K

In addition to these measures the dwellings have been designed with an air tightness of >4m2/hr@50pa, this significantly exceeds the current standards set out in the Building Regulations.

After the design of the external envelope of the building was finalised, the demands for heating and hot water were analysed to determine a system that would be most appropriate for the development. The pro-posed solution is to incorporate a highly efficient condensing boiler.

Use of low energy LED light fittings across the scheme further enhances the carbon efficiency of the development, Low flow rate taps, showers and reduced capacity cisterns all combine to further ensure efficient use of water; reducing total water demand by this residential scheme markedly.

Provision for the storage of waste recycling receptacles will be provided and a Site Waste Management Plan will be implemented during the construction phase of the development reducing the amount of waste that would be ultimately destined for landfill (Policy DM11 – Sustainable Development Standards).

8. Access

The existing site access that will be utilised connecting to Drigg Road highways to the south elevation, The plot benefits from a proposed parking for 2 – 3 cars as indicated on plan and boasting 71m² permeable Marshal Tegulars driveway with the site entrance provided with full length channel drain (as plan) to prevent rainwater runoff onto highway.

9. Scale

The proposed development has been designed in keeping with the local vernacular architecture and to replicate the scale of the adjacent dormer bungaklows.

- 69m² - Rear Garden
- 100m² - Front Garden
- 71m² - Driveway
- 77m² - Footprint
- 337.8m² - Plot

It is considered that the scheme respects the visual environment in which it sits and would positively enhance the locality by redeveloping the existing commercial site, every effort has been made to ensure the scale of the proposed development reflects that of proposed neighbouring properties and the site.

- Plot size 337.8m²
- Dwelling size 77m ²
- Plot Development ratio 22.8 %

This development ratio is considered extremally low in comparison to the majority of all new builds and within planning guidance and the adjacent properties.

- Chelmsford 136m² footprint
- Annasdale 101m² footprint
- Drummore 77m² footprint

Boundary treatment

- All existing 900mm brick walls to be retained as per the plan,
- side and rear garden areas to include an additional 1800mm high timber hit & miss fence from the proposed front elevation to assist with mutual privacy.
- Front elevation boundaries to be fully retained and unaltered 900mm high brick walls
- Current boundary and vision masked by existing 2000mm high hedge and the proposed dwelling will be masked by the 1800mm high fence

10. Proposal

The proposal is to provide planning for a proposed dormer bungalow (3 bedroom) self-build dwelling which is highlighted as a shortage with a maximum capacity of 6 people in line with the the SHLAA – see below abstracts and within the current settlement boundary.

Variation in current dwelling profile from household aspirations

Dwellling type	Sub-area							
	Whitehaven	Cleator Moor	Egremont	Whitehaven Rural Parishes	West Lakes (LDNP)	West Lakes (CD)	Millom	Total
House 1/2 Beds	5.8	10.7	5.9	8.3	8.5	-0.3	16.3	7.7
House 3 Beds	12.0	13.2	13.6	4.5	1.8	1.1	13.0	9.4
House 4 or more Beds	-9.9	-12.6	-14.2	-5.2	-0.1	7.2	-16.7	-8.6
Bungalow	-12.1	-8.5	-7.4	-5.6	-11.7	-4.4	-10.5	-9.2
Flat	4.2	-3.0	1.1	-2.5	-1.6	-4.5	-2.4	0.1

Variation in current dwelling profile from household expectations

Dwellling type	Sub-area							
	Whitehaven	Cleator Moor	Egremont	Whitehaven Rural Parishes	West Lakes (LDNP)	West Lakes (CD)	Millom	Total
House 1/2 Beds	-2.5	2.4	-2.3	0.1	0.2	-8.5	8.1	-0.6
House 3 Beds	7.7	8.9	9.3	0.1	-2.6	-3.3	8.7	5.1
House 4 or more Beds	0.1	-2.6	-4.1	4.8	10.0	17.2	-6.7	1.4
Bungalow	-8.4	-4.9	-3.7	-2.0	-8.0	-0.8	-6.8	-5.5
Flat	3.2	-4.1	0.0	-3.6	-2.7	-5.6	-3.5	-1.0

Insufficient stock Sufficient stock

Dwelling type/size summary	% Profile of new dwelling stock based on:		
	Current stock	Like	Expect
House 1/2 Beds	15.4	7.7	15.9
House 3 Beds	43.5	34.1	38.5
House 4 or more Beds	21.0	29.6	19.5
Bungalow	13.4	22.6	18.9
Flat	6.2	6.1	7.2
Other	0.5	0.0	0.0
Total	**100.0**	**100.0**	**100.0**

Source: 2010 Household Survey; rebased to 2011 census

Saved Policy ST2 states that development will be permitted **"within the defined settlement boundaries"** in accordance with the development hierarchy. This prevents development on sites outside but directly adjoining the boundary that may otherwise be suitable.

5.10.1 The NPPF, paragraphs 117 and 118 states that priority should be given to the development of previously developed (brownfield) land. In relation to housing the Core Strategy Policy

SS2 requires 50% of new housing development to be on previously developed sites.

5.10.2 The NPPF no longer includes a target relating to the amount of development which should be on brownfield sites, however it states in paragraph 68 that 10% of housing should be brought forward on small sites under a hectare.

5.10.4 It has become clear from initial evidence base work that there are insufficient brownfield sites to meet the housing requirement over the Local Plan period.

It is proposed to retain the existing 900mm high wall to the North, South, West & East boundary elevation and the existing commercial site entrance to the coal store, the site is allocated as brownfield site and suits the proposal for redevelopment.

11. Amount

The proposed dormer dwelling suggestions the following dimensions;

- Plot size – 17000mm wide x 9600mm deep = 337.8m²
- Parking /hard standing area m x 7.500mm x 11.000mm drive to the front – 98m² - 2-3 car (Parking)
- 1060mm to West boundary & 3250mm to East Boundary
- Rear garden - 6100mm x 10900mm – 66m²
- Dwelling plan – 11000mm x 7000mm – 77m² footprint
- Chelmsford 136m² footprint – Annasdale = 101m² footprint - Drummore 77m² footprint

This will make our proposal the smallest footprint & development ratio on the row

12. Overlooking & Impact

The proposal is considered that acceptable overlooking distances would be maintained throughout the site and provide a balance which results in a good design solution for the site,

- Front elevation facing the road (South) with minimum 26m separation distance as DM12
- Rear elevation facing rear garden (North) with 25m separation distance as DM12
- East side Elevation 9580mm from Chelford non habitable and secondary windows facing the proposed dwelling which is an increase of 4m separation distance to large existing garage built directly on the boundary.
- West side Elevation 10750mm from Annasdale non habitable and secondary habitable windows facing the plot but not the proposed dwelling due to the large set back.
- All ground floor openings on side elevations – side door, bathroom & velux windows to have obscure glazing (grade 5 translucence) as DM12 as these are not facing the prosposed dwelling due to the set back.
- Primary entrance to the frontage
- Discussed and had verbal support from direct neighbours.
- All single storey and roof pitch altered to ensure the design is not imposing on the adjacent properties and match both adjacent dwellings and comply with the merit of DM12
- Dwelling position on site set back minimum 2m to minimise of the visual prominence and impact on streetscape and adjacent properties.
- Chelmsford 136m² footprint – Annasdale = 101m² footprint - Drummore 77m² footprint
- 1050mm at pitch point as required within DM12

13. Environmental and geological

The site has not been inspected and tested or benefit from a phase 1 desk top study or phase 2 ground investigation Report however I have highlighted the following;

- No ground contamination thought to be on site however the owner and ground workers ***MUST*** carry out a watch brief and if any contamination found it must be reported to CBC
- Foundations need inspected by Building Control, they will confirm that the property will be suitable on either a raft or reinforced strip footing – report to be finalised for Building Control)
- Radon barrier is not required (see appendix radon report)

Surface water to be discharged into soakaway drainage system as shown on drainage plan.

Environmental performance
The Main Contractor will be carrying out the following tests in order to ensure current environmental standards are met and ideally surpassed throughout the works.

- Air quality monitoring will be undertaken at key stages throughout the works where airborne dusts and omissions and issues could be identified.
- Noise and vibration monitoring will be undertaken to ensure acceptable levels are adhered to or surpasses and assessed throughout the works.
- Hazardous material testing where identified will be undertaken alongside specific works RAMS and requirements as per UKAS17025 and associated asbestos documentation (please see separate reports).
- The existing infrastructure has been fully tested and cleared for all residues, oils and contamination and materials from within the existing client's site information.
- Full certification and associated completion reports are included within this pack and will be confirmed prior to removal of potentially sensitive items if required or highlighted during a watch brief
- All work to be carried out in accordance with the Construction Phase Plan and Health & Safety Method Statement carried out by the contractor.

Contaminated Land
The site has no known (expressed) contamination however if any contamination was found the during the watch brief the site would require a phase 1 desk top study carried out to highlight the necessity to carry out the phase 2 ground investigation or Phase 3 remediation as required by the Environmental Health Act Part 2A,

Sound
To Be Kept to a minimum throughout the works. Where excessive noise is required for short periods this works should be undertaken between the hours of 8am-5pm.

Road Cleaning
To be conducted pro-actively throughout the works if required using mechanical sweeping if required

Air Quality/Dust Management
All Operatives to wear suitable RPE and PPE throughout the works. Pre-dampening and pre-cleaning will minimise the potential for dust nuisance.

Water usage should be restricted to just enough to dampen the area and not cause undue water run off or damage.
Excess water to be controlled and sifted prior to be directed to surface water drainage. Water usage is to be monitored throughout the works by the site supervisor.

Waste (including Hazardous)
All waste will leave site as per the current Hazardous Waste Regulations 2009 and be disposed on in a safe manner to the required landfill – Main contractor's responsibility.

Water Courses and Groundwater
No water courses currently would be affected within the site boundary

14. Drainage

The site also benefits from an existing private combined drainage system (surface and foul water) see plan for location of on-site drains, it is intended that the foul and surface water would separate and be laid around the property to facilitate or proposal.

The foul and surface water layout will be as drainage plan, the drains will/do consist of the following;

- 100mm waving plastic drainage system
- 100mm concrete encasement (where required for protection) or full bedded in pea gravel
- 1-60-80 falls minimum
- 450mm PPIC Inspection chambers at change of gradient and direction
- 3-bedroom dwelling = 6 people x 200lt per person per day = Total 1200lt per day norm

ALL DRAINAGE WILL BE INSTALL AS APPROVED DOCUMENT PART H

Drainage Pipes to be 100mm Plastic Pipe Laid in accordance with Approved Document Part H (Assume FFL Plot = 10.00)				
Surface Water Drainage				
Chamber Name	**Invert Level**	**Cover Level**	**Distance**	**Fall**
Soakaway	8.900	N/A		
S1	9.000	9.850	6.100	1:40
S2	9.000	9.850	4.500	1:30
Foul Water Drainage				
Chamber Name	**Invert Level**	**Cover Level**	**Distance**	**Fall**
Existing	9.450	9.850		
F1	9.500	9.850	1.300	1.26
F2	9.600	9.850	6.500	1.65

Surface water design

Option 1 – traditional Soakaway designed in accordance with Part H & BRE365
Option 2 – connect to the existing combine water system (Not connecting to the main combined sewerage system) – still to be located

Option 1

This was the preferred SUDS drainage system as ground conditions (very sand) are perfect for soakaway

Percolation test data (Approved Document Part H)
1no test holes at 300mm x 300mm set below incoming flow level, the water was timed between 75% & 25% in seconds as below;

Vp
Test 1 – 2 mins
Average percolation time – 2 min
Vp - 143 x 60 / 150 = 0.8 sec per mm

Roof area
Based on a property with a floor area of 108m²
A x 1.29 (roof pitch factor)
Surface water -108m² x 1.29 = 139.32m² + 105m² hardstanding = 244.32m²

Incoming Water
Based upon 20mm total rainfall
244.32m² x 0.020 = 4.88m³ (surface water)
Total Incoming water = 4.88m³

Soil filtration

$$f = \frac{10-3}{3Vp}$$

$$\frac{0.001}{(3x0.8)2.4} = \mathbf{4.11m^3}$$

Outfall Volume
f = Soil filtration – d = Duration of storm in minutes
$O = as^{50} \times f \times d$
O = .0135 x 4.11 x 60 = **3.32m³**
Soakaway Volume
4.88m³ + 3.32m³ = **8.21m³**

Soakaway Required
Part H Design – 8.21m³ + 5% voids = 8.62m³
BRE Design (see attached calcs – Fig 16) = 5.44m³

Soakaway Tank size
Tank Size – 10.8m x 1.2m x 0.42m

Soakaway trial holes taken from the middle of the site – see drainage plan in appendix.

15. Vision

- To propose a scheme that fulfils the requirements and principles set within Copeland Borough Councils Local Plan, outline planning approval and Interim Housing Policy.
- The proposed scheme seeks to create a sense of space within a design led approach that contributes positively to locality and responds creatively to the setting and maximising the site.
- The aspiration to create a cohesive design that brings character to the area and exciting home that meet the needs of residents, CBC Planning Policy, and minimise impact on the environment.
- The design aspirations for the proposed follows key objectives for good urban design
- The plot will provide positive amenity for the residents (parking and recreational).
- Layouts and design seek to maximise privacy, create street scene interest through and minimise the impact on adjacent property/land owners.
- Suitable vehicular and pedestrian's access in accordance with highways requirements.
- Provision of a sustainable drainage solution to both surface and foul water.

16. Appendices

Photo 1 – Arial Photo of whole Site

Photo 2 – Arial Photo of whole Site

Photo 3 – Arial Photo of whole Site

Photo 4 – Arial Photo of whole Site

Photo 5 – Arial Photo of whole Site

Photo 6 – Arial Photo of whole Site

Photo 7 – Arial Photo of whole Site

Photo 8 – Arial Photo of whole Site

Fig 7 – Site Allocations (Local Plan)

4.7 Local Centres Strategic Summary

4.7.1 The Core Strategy lays down the following principles for future development in local centres:

- New housing should not be more than 20% of the total provided in the Borough and should be built within the defined physical limits of development of the settlement as appropriate. Where needed, small extension sites on the edges of settlements may be permissible.
- New housing will be provided to meet general and local needs, and may be on 'windfall' rather than allocated sites. The provision of affordable housing is desirable.
- The emphasis in planning for employment will be on retention of existing businesses and premises. Expansion potential may include tourism related development but that should be limited by the need to respect the environment. New provision will most likely arise either in converted or re-used existing buildings, or on sites already allocated in the 2006 Local Plan.
- Retail and service provision should focus on shopping to meet local day-to-day needs (although farm shops may be encouraged where not conflicting with other policies); again, the Council will emphasise retaining existing businesses.

Strategic options for the Local Centres

4.7.2 As each of these settlements has a different character, the choices for each individual village, including settlement boundary changes where there are potential sites that would require it, are dealt with in the following pages.

Note that the approach for planning for business development (including local services such as shopping) is set by the Core Strategy, and therefore alternative approaches are not put forward.

4.7.3 The Council has considered three possible ways of distributing development land between these centres.

4.7.4 ***Option 1: An even distribution allocating land for development in each place.*** There is logic in giving every village a share of the quantum of development that is allowed for at this level. The chief advantage is that it would mean that no one settlement would seem to be taking 'more than its share'; it might also be argued that it would result in more certainty of development, particularly for housing, being distributed evenly across the more rural areas. However, the SHLAA exercise has gone through three phases of inviting offers of land for development and there are a number of villages where little or no land has come forward – there is no reason to suppose that this will change. Alternatively, a potentially serious disadvantage would be that it would lead to pressure for land releases in places that do not have the right character, or the environmental capacity, to absorb so much development.

4.7.5 ***Option 2: Allocate land for development where sites have been offered.*** This approach has the merit of focusing on places where we know that land can be brought forward. The disadvantage is that there may be places where people feel that an

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excessive share of development is being planned for. It might also lead to some villages growing too fast, putting pressure on local infrastructure (such as roads) or services (such as schools) and sucking development away from the towns.

4.7.6 ***Option 3: Allocate land with regard to the capacity of villages to take it, as well as the availability of sites.*** This approach also focuses on the places where we know that landowners are willing to see development happen, but balanced against the environmental capacity of those places to accept development. This reduces the risk of large scale development in a small number of villages skewing the overall balance of housing across the district and increasing pressure for villages to grow faster than the Core Strategy permits. As with Option 2, there is a risk that people in some villages might feel that they are being 'swamped' by large housing development.

4.7.7 Options 2 and 3 would not stop development in villages with no allocated land, as small scale 'windfall' sites can still come forward as they have in the past.

4.7.8 The Council's preferred approach is Option 3

4.7.9 An approach that takes advantage of land availability where there is land available, rather than going looking for more in places where none has come forward, must be the more practical alternative. Care will need to be taken to make sure that villages where a lot of land has been offered are not 'swamped' by development. Option 3 provides a better basis than Option 2 for doing this. However, the number of places where this may be a threat is less than would be the case if Option 1 were adopted, and the plan proposed development in places where there has been no demand for it.

Implementation – Philosophy for Land Release

4.7.10 Development is most desirable in the towns and, where land is suitable for development, it is made available even if that means there is a surplus.

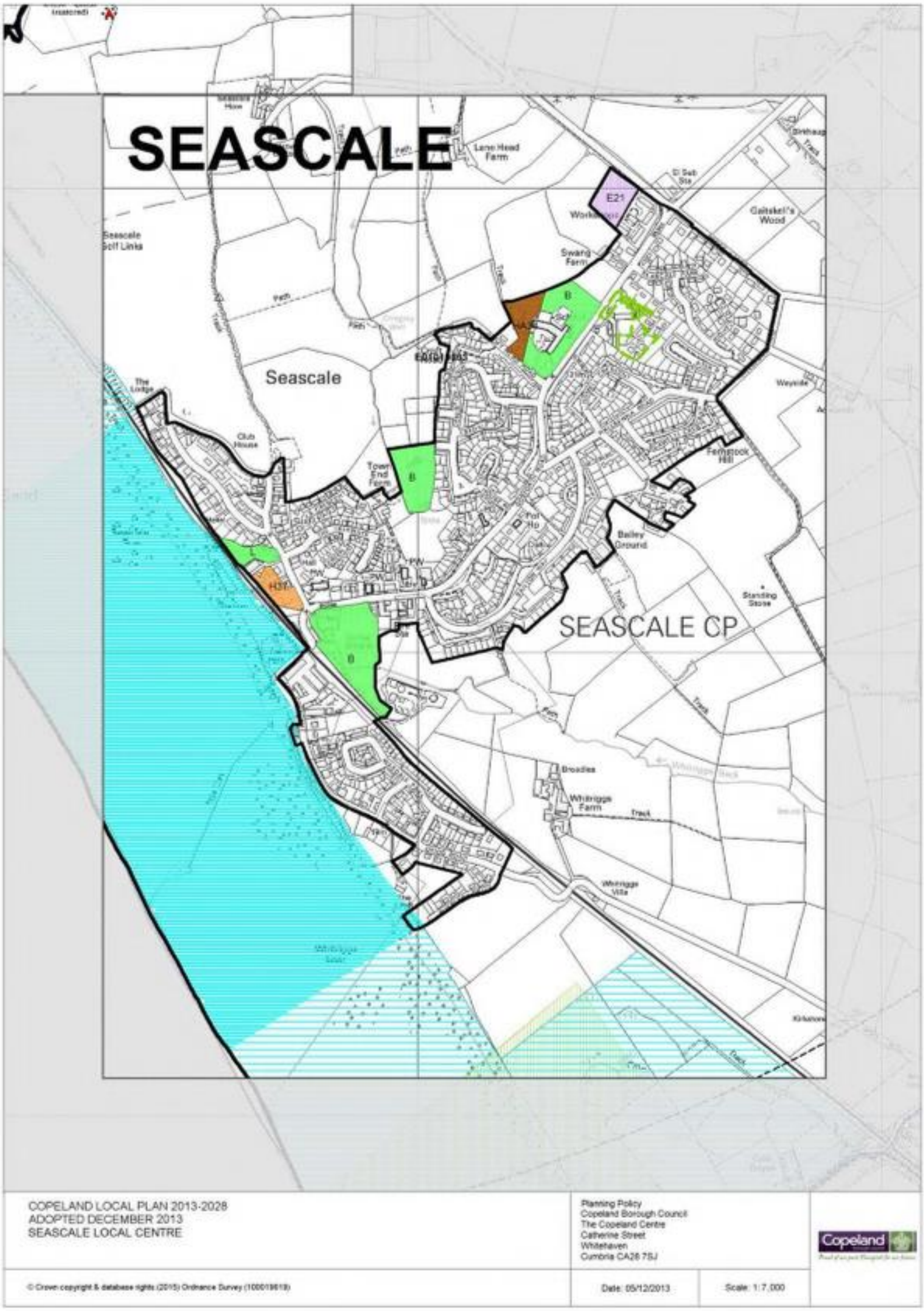
4.7.11 The exception to that would be where release of a particular site or sites might prejudice development of other, sequentially preferable sites.

4.7.12 In smaller settlements land release will be monitored to make sure that development in these places is not taking place at excessive levels, that is, at a rate which could threaten urban regeneration. In pursuit of this aim, some sites whose development is acceptable will be phased.

Place ref.	Site	SHLAA Ref	SHLAA RATING	Yield	Assessment
	Moor Row suitable housing sites total			**309**	
Se1	Links Crescent	S043	0-5	**30**	Planning permission for housing
Se2	Town End Farm East	S109	0-5	**38**	Consider allocation for housing.
Se3	Croft Head Road	S348	0-5	**20**	Consider allocation for housing.
Se4	Swang Farm	S099	6-15	**37**	Consider allocation for housing.
	Seascale suitable housing sites total			**125**	
Sb2	*Abbey Road 1*	*S229A*	*0-5*	***11***	*On site*
	St Bees suitable housing sites total			**11**	
Th1	South of Thornhill	CS79	6-15	*(230)* **75**	Allocate part; whole site likely to be unacceptable
	Thornhill suitable housing sites total			**75**	

Local Centres total 1,142 (1,377)
Target (= 'ceiling') 690 - 830

NB this figure excludes
Cleator (161); Haverigg (81), which are considered alongside Cleator Moor and Millom respectively.


SEASCALE
Seascale
SEASCALE CP
Lane Head Farm
E21
Swang Farm
Seascale Golf Links
Gaitskell's Wood
Club House
Town End Farm
Bailey Ground
Standing Stone
Broadlea
Whitriggs Farm
Whitriggs Villa
Track
COPELAND LOCAL PLAN 2013-2028
ADOPTED DECEMBER 2013
SEASCALE LOCAL CENTRE
Planning Policy
Copeland Borough Council
The Copeland Centre
Catherine Street
Whitehaven
Cumbria CA28 7SJ
Copeland
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Date: 05/12/2013
Scale: 1:7,000

Fig 8 – Flood Map (Environment Agency)

Environment Agency

Flood map for planning

Your reference	Location (easting/northing)	Created
Drummohr	**304087/500578**	**1 Aug 2021 22:06**

Your selected location is in flood zone 1, an area with a low probability of flooding.

This means:

- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems

Notes

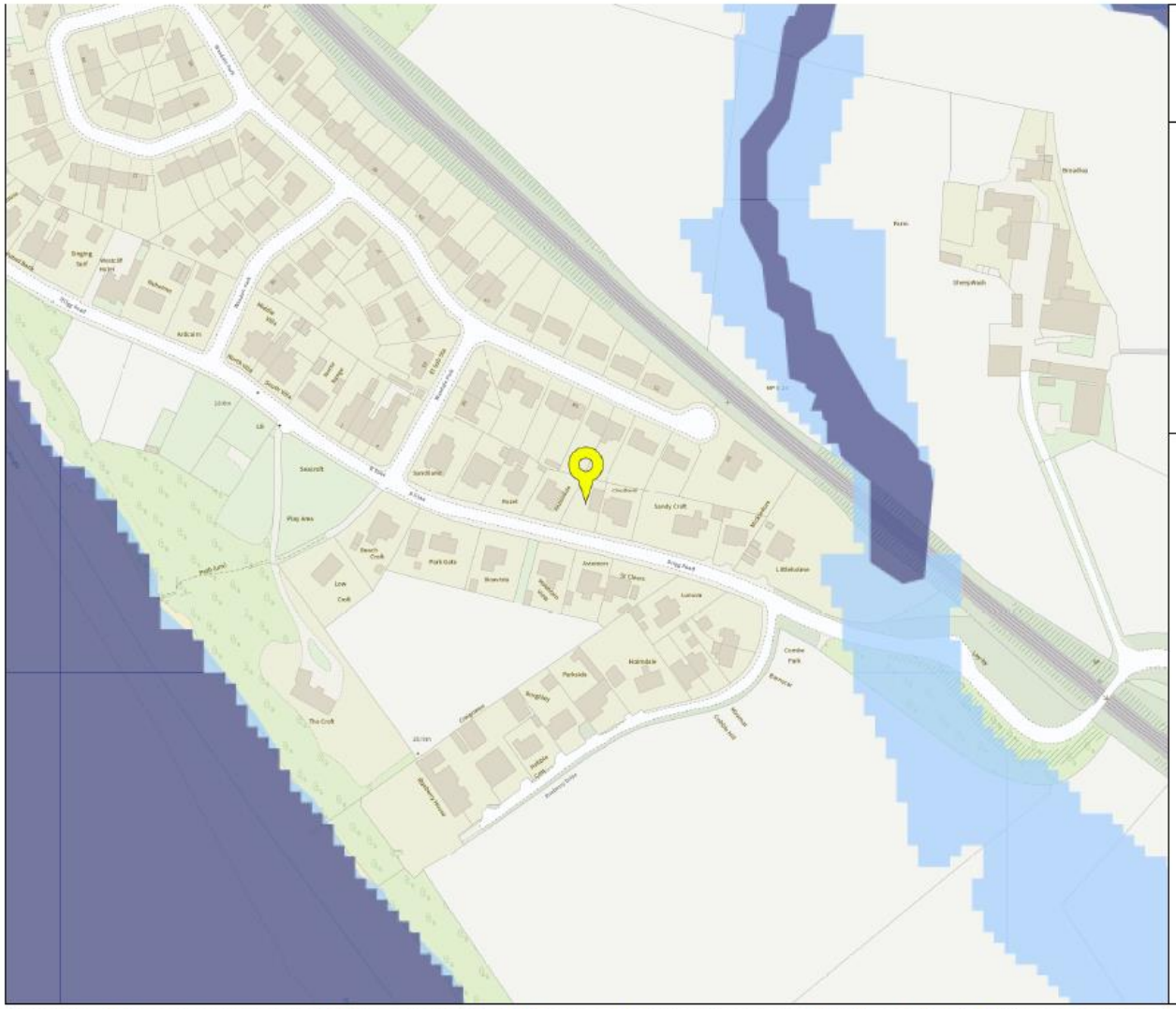
The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence which sets out the terms and conditions for using government data. https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2021 OS 100024198. https://flood-map-for-planning.service.gov.uk/os-terms

Page 1 of 2



Environment Agency

Flood map for planning

Your reference
Drummohr

Location (easting/northing)
304087/500578

Scale
1:2500

Created
1 Aug 2021 22:06

- Selected point
- Flood zone 3
- Flood zone 3: areas benefitting from flood defences
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Flood storage area

0 20 40 60m

Page 2 of 2

Fig 9 – Radon Report (BGS)

Public Health England

Report of address search for radon risk

British Geological Survey

Radon Risk Report for addresses in England and Wales

Address searched: Drummore, Drigg Road, Seascale, CA201NX
Date of report: 8 August 2021

Guidance for existing properties

Is this property in a radon Affected Area? - No

A radon Affected Area is defined as where the radon level in at least one property in every hundred is estimated to exceed the Action Level.

The estimated probability of the property being above the Action Level for radon is: 0-1%

The result may not be valid for buildings larger than 25 metres.
If this site if for redevelopment, you should undertake a GeoReport provided by the British Geological Survey.

This report informs you of the estimated probability that this particular property is above the Action Level for radon. This does not necessarily mean there is a radon problem in the property; the only way to find out whether it is above or below the Action Level is to carry out a radon measurement in an existing property.

Radon Affected Areas are designated by the Public Health England. PHE advises that radon gas should be measured in all properties within Radon Affected Areas.

If you are buying a currently occupied property in a Radon Affected Area, you should ask the present owner whether radon levels have been measured in the property. If they have, ask whether the results were above the Radon Action Level and if so, whether remedial measures were installed, radon levels were re-tested, and the results of re-testing confirmed the effectiveness of the measures.

Further information is available from PHE or https://www.ukradon.org

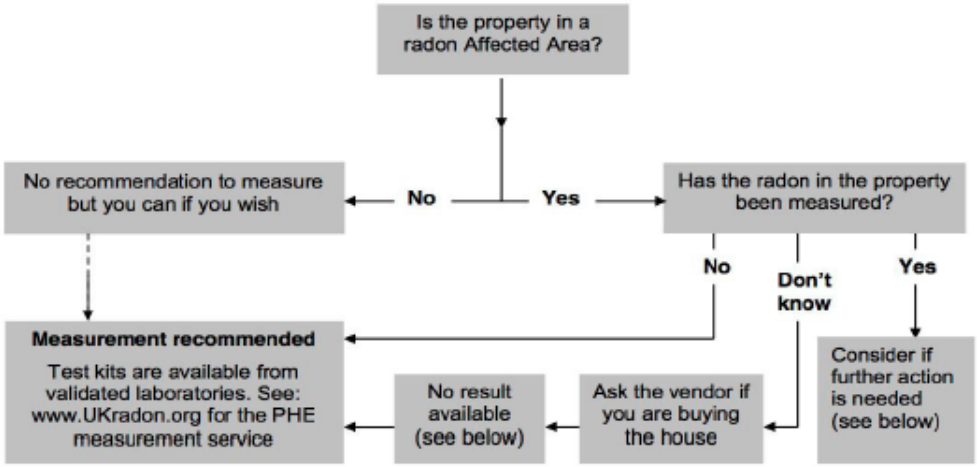
Guidance for new buildings and extensions to existing properties

What is the requirement under Building Regulations for radon protection in new buildings and extensions at the property location? - None

If you are buying a new property in a Radon Affected Area, you should ask the builder whether radon protective measures were incorporated in the construction of the property.

See the Radon and Building Regulations for more details.

PHE guidance for occupiers and prospective purchases



Existing radon test results: There is no public record of individual radon measurements. Results of previous tests can only be obtained from the seller. Radon levels can be significantly affected by changes to the building or its use, particularly by alterations to the heating and ventilation which can also be affected by changes in occupier. If in doubt, test again for reassurance.

Radon Bond: This is simply a retained fund, the terms of which are negotiated between the purchaser and the vendor. It allows the conveyance of the property to proceed without undue delay. The purchaser is protected against the possible cost of radon reduction work and the seller does not lose sale proceeds if the result is low. Make sure the agreement allows enough time to complete the test, get the result and arrange the work if needed.

High Results: Exposure to high levels of radon increases the risk of developing lung cancer. If a test in a home gives a result at or above the Action Level of 200 Becquerels per cubic metre of air (Bq/m3), formal advice will be given to lower the level. Radon reduction will also be recommended if the occupants include smokers or ex-smokers when the radon level is at or above the Target Level of 100 Bq/m3; these groups have a higher risk. Information on health risks and radon reduction work is available from PHE. Guidance about radon reduction work is also available from some Local Authorities, the Building Research Establishment and specialist contractors.

PHE designated radon website: https://www.ukradon.org
Building Research Establishment: http://www.bre.co.uk/page.jsp?id=3137

Fig 10 – Proposed Marley Modern Roof Tile

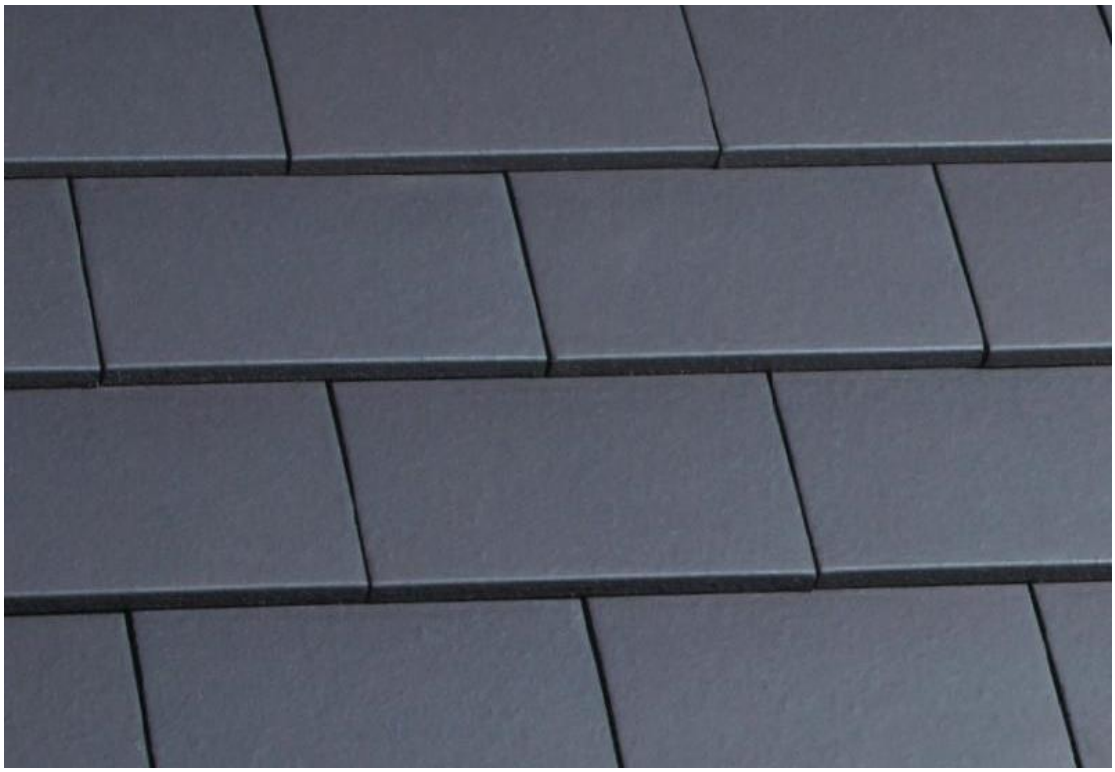


Fig 11 – Proposed Marshal Tegulars Drive setts

Fig 12 – Cross section A of Soakaway

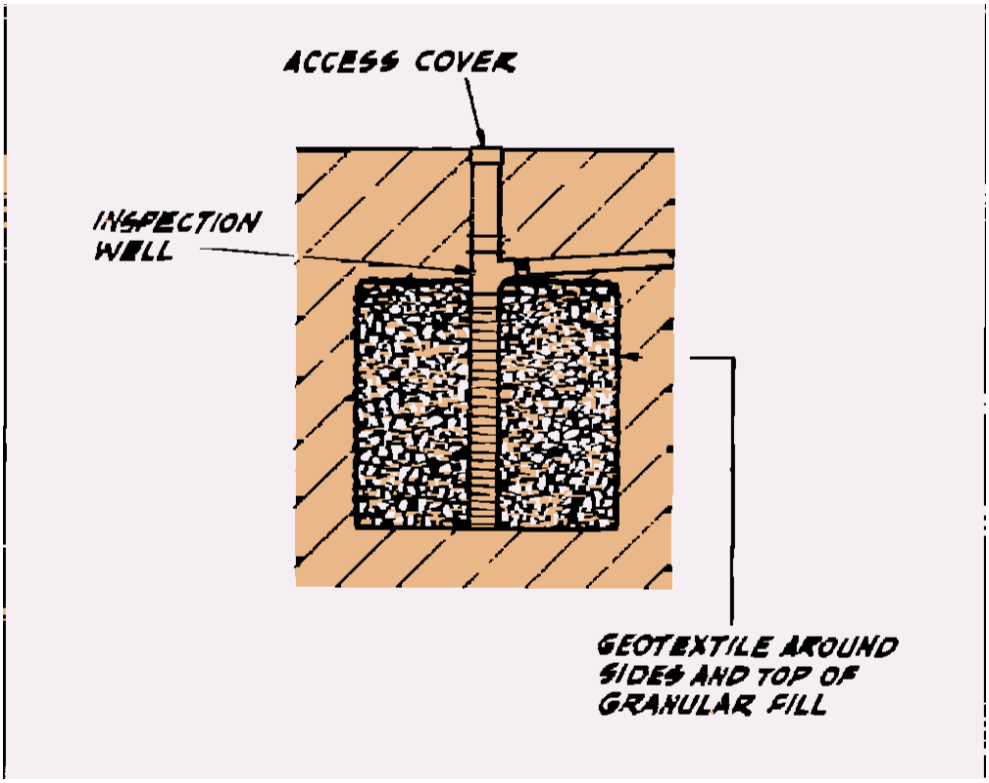


Fig 2 - Cross Section B of Soakaway

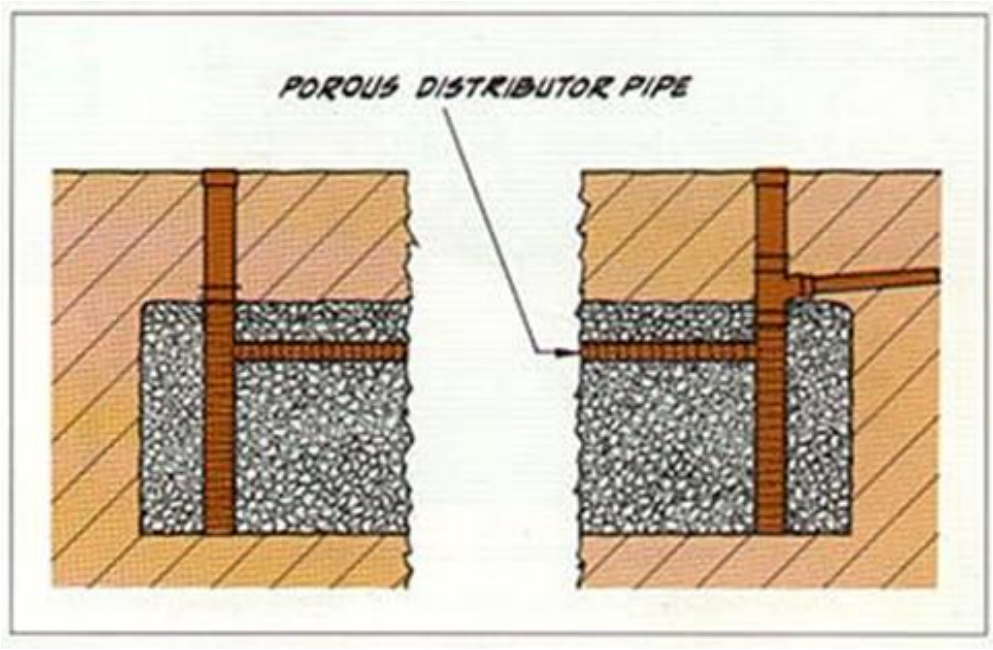


Fig 13 – National rainfall tables

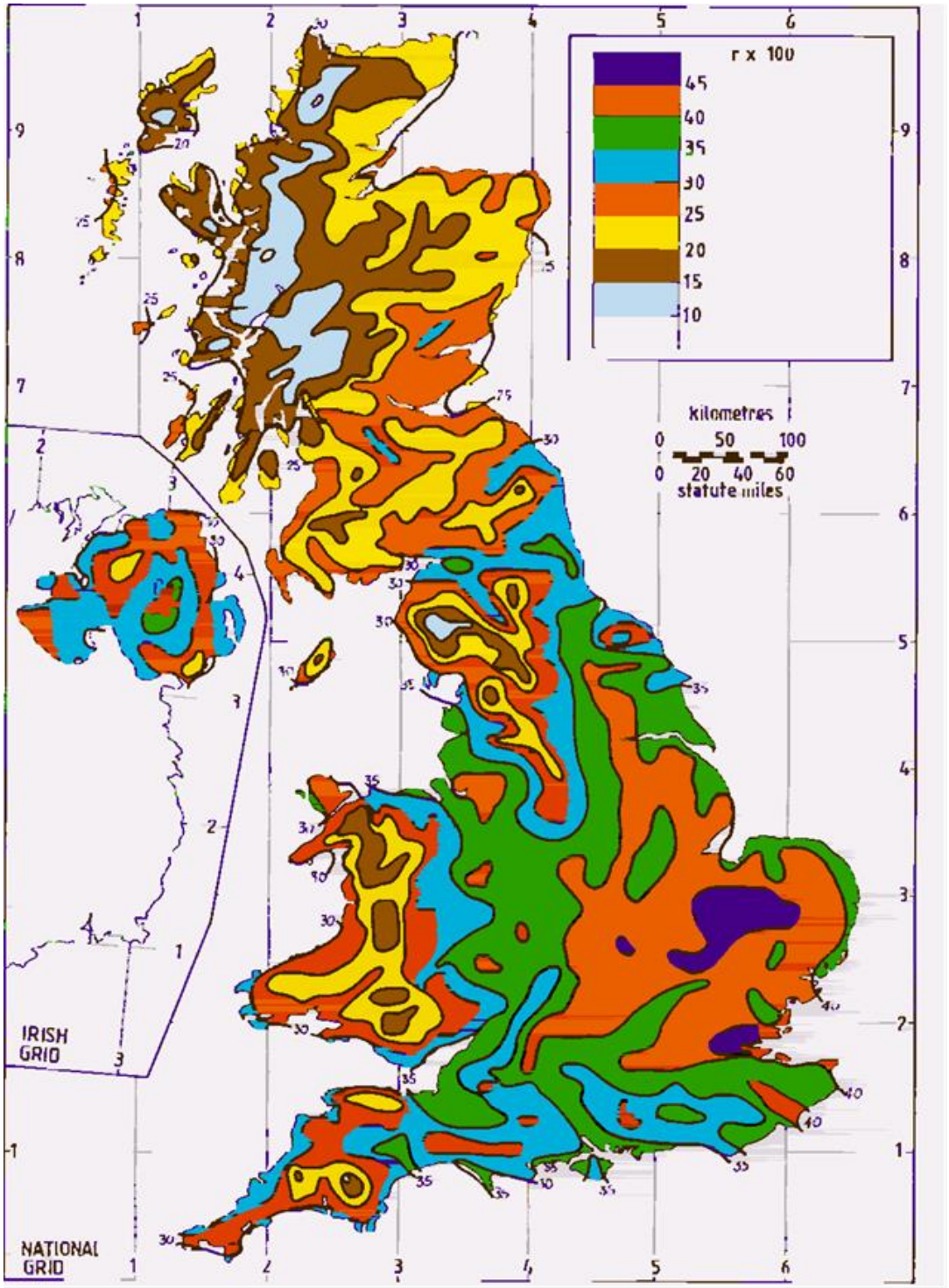
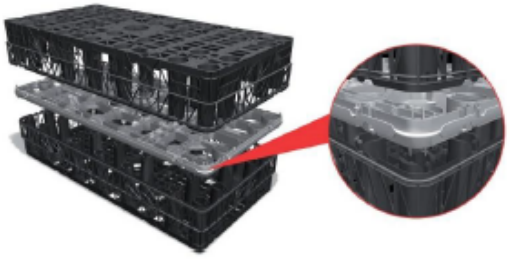


Fig 14 – Rainbox 3S/core surface water attenuation/Soakaway system

rainbox® 3S

Technical Data Sheet

The RAINBOX® 3S crate consists of two half-boxes and a centre plate; assemble these prior to their installation within the crate structure.



Dimensions:	1200 x 600 x 420mm
Gross Volume:	302 L
Storage Volume:	290 L
Void ratio:	96 %
Materials:	Polypropylene
Recyclable:	100 %
Approximate weight:	11.5 Kg
Inspectable:	Yes

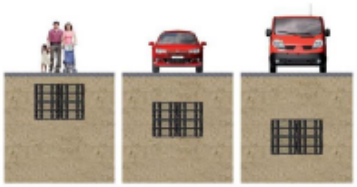
Crates are linked by clips 

Connection Options

The RAINBOX® 3S comes with pre-formed cut-outs for connecting pipework up to 160mm OD. For larger sizes, up to 400mm OD, specially made adaptor plates can be used.

Design & Installation Guidance

Vertical loading to the crate structure is determined by the cumulative loads associated with the backfill and any loads linked to operations (vehicular loads (live loads) or permanent structures (dead loads)). Horizontally loading is determined by the pressure exerted by the earth.



The resulting information determines the minimum and maximum covering height and the maximum excavation depth.
Table 1 shows the parameters for different applications.

Table 1

(For Guidance Only*)

	Load (GVW)		
	Pedestrians	Small Vehicles ≤ 3T	Vehicles ≤ 12T**
Coverage in m (based on backfill φ' 30° and density 20kN/m³)			
Min.	0.30	0.50	1.20
Max.	2.50	2.20	2.00
Max Excavation Depth in m			
with backfill φ' 20°	2.90	2.90	2.90
with backfill φ' 25°	3.80	3.80	3.50
with backfill φ' 30°	4.00	4.00	4.00

* The installer of the Rainbox 3S system should ensure that a structural design check in line with CIRIA C680 has been carried out prior to work commencing.
** Use by heavier vehicles may be permissible depending on site conditions. Please contact JDP Technical Support for more information.

JDP Technical Support – Tel: 01228 794426; E-mail: technical@jdpipes.co.uk

JDP reserve the right to make alterations to this document without prior notice or update. Information correct as of 1st August 2017.

rainbox® 3S

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website: www.dyka.com

BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

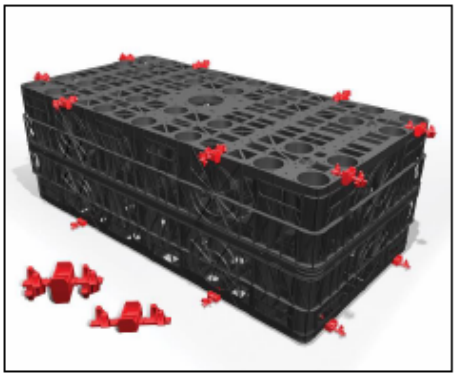
Agrément Certificate
17/5469
Product Sheet 1

DYKA STORMWATER MANAGEMENT SYSTEMS

DYKA RAINBOX 3S STORMWATER MANAGEMENT SYSTEM

This Agrément Certificate Product Sheet[1] relates to the DYKA Rainbox 3S[2] Stormwater Management System, comprising polypropylene modules which can be used to construct below-ground water storage attenuation tanks or soakaways, to manage stormwater run-off from impermeable surfaces.

(1) Hereinafter referred to as 'Certificate'.
(2) Rainbox 3S is a registered trademark.



CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Hydraulic design — data are provided in this Certificate to assist in the design of a below-ground stormwater management system using DYKA Rainbox 3S (see section 6).

Structural performance — the system has adequate strength and stiffness to resist short- and long-term loading when used in accordance with this Certificate (see section 7).

Maintenance — data are provided in this Certificate to assist in planning the maintenance of a completed DYKA Rainbox 3S Stormwater Management System installation (see section 11).

Durability — the system will have a life in excess of 50 years when installed in accordance with this Certificate (see section 12).

The BBA has awarded this Certificate to the company named above for the system described herein. This system has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of First issue: 12 January 2018

Paul Valentine
Technical Exellence director

Claire Curtis-Thomas
Chief Executive

The BBA is a UKAS accredited certification body – Number 113.
The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk
Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

British Board of Agrément
Bucknalls Lane
Watford
Herts WD25 9BA

tel: 01923 665300
clientservices@bbacerts.co.uk
www.bbacerts.co.uk

Regulations

In the opinion of the BBA, the DYKA Rainbox 3S Stormwater Management System, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):

The Building Regulations 2010 (England and Wales) (as amended)

Requirement:	**H3(3)**	**Rainwater drainage**
Comment:		The system can be used in a construction to satisfy this Requirement. See section 6 of this Certificate.
Regulation:	**7**	**Materials and workmanship**
Comment:		The system is acceptable. See section 12 and the *Installation* part of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	**8(1)(2)**	**Durability, workmanship and fitness of materials**
Comment:		The system can contribute to satisfying this Regulation. See sections 11 and 12 and the *Installation* part of this Certificate.
Regulation:	**9**	**Building standards applicable to construction**
Standard:	3.6	Surface water drainage
Comment:		The system can contribute to a construction satisfying this Standard, with reference to clauses 3.6.1[(1)(2)] to 3.6.5[(1)(2)]. See section 6 of this Certificate.
Standard:	7.1(a)(b)	Statement of sustainability
Comment:		The system can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.
Regulation:	**12**	**Building standards applicable to conversions**
Comment:		Comments in relation to the system under Regulation 9, Standards 1 to 6 also apply to this Regulation, with reference to clause 0.12.1[(1)(2)] and Schedule 6[(1)(2)].

(1) Technical Handbook (Domestic).
(2) Technical Handbook (Non-Domestic).

The Building Regulations (Northern Ireland) 2012 (as amended)

Regulation:	**23(a)(i)(iii)(b)**	**Fitness of materials and workmanship**
Comment:		The system is acceptable. See section 12 and the *Installation* part of this Certificate.
Regulation:	**82**	**Rainwater drainage**
Comment:		The system can be used in a construction to satisfy this Regulation. See section 6 of this Certificate.

Construction (Design and Management) Regulations 2015
Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See sections: 1 *Description* (1.1), 3 *Delivery and site handling* (3.3, 3.5 and 3.6) and 15 *Procedure* (15.1 and 15.10) of this Certificate.

Technical Specification

1 Description

1.1 The DYKA Rainbox 35 Stormwater Management System comprises modular units manufactured from polypropylene (see Table 1 and Figure 1) that clip together on site to form tanks of the required dimension. The units have pre-formed sockets to enable connection with 110 and 160 mm diameter pipework (to BS EN 1401-1 : 2009).

Table 1 Characteristics of units

Characteristic (unit)	Value
Dimensions (nominal) (l x w x h) (mm)	1200 x 600 x 420
Volume (nominal) (m^3)	0.3024
Storage volume (nominal) (m^3)	0.2903
Porosity (%)	96
Nominal mass per cell (kg)	11

1.2 Half and Full Click Connectors are manufactured from red polypropylene and used to secure the units together (see Figure 1).

Fig 15 – Marshal Drive Sett Tegula Permeable Paving – Driveways & Shared Private Access

Marshalls

Creating Better Spaces

INSTALLATION DETAILS FOR DRIVESETT TEGULA PRIORA PAVING

General Information

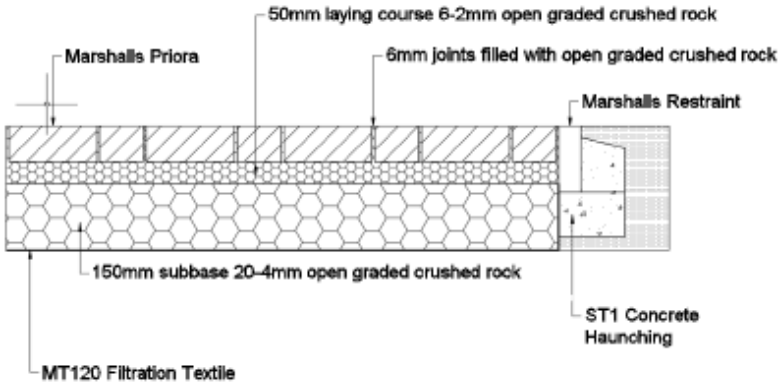
On delivery, the product should be inspected. If there are any issues, please report them immediately and do not commence installation.

Before installation commences a certain amount of sorting of the product may be required to ensure consistency of colour, texture and dimensional tolerance.

Check for services and contact the service provider for advice if gas or electric services run through the intended Priora site. Care must be taken when constructing over sewer, rainwater and water pipes to ensure that the services remain supported for their full length by undisturbed material and are surrounded on the remaining sides by a minimum of 150mm of 4-20mm material.

Health and Safety Information

Safe working practices should be employed at all times during the construction process and all necessary Personal Protective Equipment (PPE) should be worn.



Domestic application only www.marshalls.co.uk Page 1 of 7
10/2018/Issue 4

Landscape House, Premier Way, Lowfields Business Park, Elland, HX5 9HT

Aggregates required
1 cubic metre equals 1.8 tonnes

Sqm drive	10	20	30	40	50	60	70	80	90	100
20mm tonne	3.5	7	10.5	14	17.5	21	24.5	28	31.5	35
6mm tonne for laying course	0.9	1.8	2.7	3.6	4.5	5.4	6.3	7.2	8.1	9.0

6mm Jointing Aggregate – 10kg per sqm

- Priora must be laid with a 20-6mm and 6-2mm clean graded angular aggregate (Open Graded Crushed Rock and Open Graded Crushed Gravel)
- The aggregate is available from Hanson Group direct on a dedicated phone line 0845 600 1616

Pavement design
A sub-base of 150mm of 20-4mm clean crushed stone with well defined edges should prove to be sufficient. However the paving design must be based upon the prevalent ground conditions and type and frequency of anticipated loads.

Excavation
To allow the new permeable block paving to be installed correctly, a certain amount of excavation is usually required. The depth of this excavation will be the thickness of the required sub-base plus the laying course and the blocks. An extremely important factor to consider when working out the depth of excavation is that the finished surface level of the blocks must be a minimum of 150mm below the DPC (damp proof course) to prevent problems with rising damp.

Edge restraints
Edge restraints should be sufficiently robust to resist the lateral displacement from imposed loadings place upon the pavement and are installed prior to the installation of the sub-base. The restraint must provide a consistent vertical face to a level below the laying course material.
For steep inclines or gradients, (greater than 1:20) the provision of intermediate restraints should be considered. Their spacing should be related to the severity of incline and overall area of paving.

Construction considerations
The sub-base material should be placed in layers not exceeding 150mm in thickness and should be suitably compacted before the next layer is placed. Each layer should be thoroughly compacted to the thickness required.
Due to the nature of both the sub-layers and the block paving, care should be taken during the construction process to prevent dirt and detritus contaminating the sub-base and compromising the permeability of the system. The trafficking of the sub-base as a site access route should not be undertaken.

Should other construction or maintenance work take place close to the pavement which may affect the infiltration of the pavement, suitable protective measures should be taken.

Laying course

The final target thickness for the laying course should be 50mm.

Tolerances for laying course material are +/-20mm. However, due to the nature of the open-graded material, a reduction in the ability to reduce the thickness of the laying course due to compaction would be experienced when compared to a sand laying course. Therefore, it is important to ensure the initial placing and screeding of the open-graded laying course is as accurate as possible.

It may prove advantageous to trial a small area of open-graded material to ascertain the characteristics of the material under compaction to ensure accurate levels are achieved. Should any disturbance of the screeded laying course material occur prior to the placement of the blocks, the affected area should be re-screeded to ensure consistency between the affected area and the surrounding laying course. When screeding rails are removed on completion of the installation of the laying course, the affected area should be filled and re-screeded with corresponding laying course material and manually compacted. Care should be taken not to disturb adjacent prepared laying course material.

Wearing course

Laying

Paving units should be installed on the laying course material so that the final level is within the permitted surface tolerance. String lines should be utilised as often as required. This is necessary to ensure the bond pattern is maintained and straight lines are achieved in the finished paving.

The manufacturing tolerances of the paving units, profile of the site and frequency of string lines should be taken into consideration during installation.

Paving units should be laid such that the joint profile interlocks with its neighbouring units. Joint widths may be varied slightly in order to achieve straight lines or maintain bond. When laying block paving, the blocks should be mixed simultaneously from a minimum of 3 packs, taking vertically from each slice offered by the pack. This is necessary to ensure an even distribution of both the colours and any manufacturing tolerances offered by the blocks.

Lay whole units first, followed by cut units around obstacles or at edges. No paving unit should be cut down to less than one quarter of its original size to prevent looseness or dislodgement at a later date. Where it appears that only a small section of block will fit, the "inboard cutting" technique should be adopted. The use of a larger or full unit against the edge restraint, allows a small unit to be placed in the resulting space.

Where slopes, gradients or ramps are being constructed, placement of the paving units should commence at the lowest point ie: the bottom of the slope, working upwards. Where there is a risk of lateral movement of the paving units due to the gradient encountered, the provision of additional intermediate restraint should be considered.

Compaction
Compaction should be undertaken with a plate vibrator. Prior to final compaction of the surface, joints should be filled with the same grading of material as that used for the laying course. All joints should remain full of jointing material at all times, with periodic checking and replacing carried out where necessary.

General
The bond pattern should be suited to the application and likely use of the paving. Areas which receive frequent vehicle turning, accelerating or decelerating should be laid in a herringbone pattern. Stretcher bond may be used successfully in very lightly trafficked areas, providing the direction of the traffic is perpendicular to the laying pattern and the paving is not subjected to the above movements. Basket weave patterns should not be used in areas receiving vehicular traffic.

Cutting
Cutting may be carried out using a diamond tipped power saw, a block-splitting guillotine, or hammer and bolster. It must however be noted that the aesthetic finish achieved will depend greatly upon the choice of cutting mechanism and the skill of the installer. Cut blocks should be inserted prior to completion of the working period to prevent any movement of unrestrained blocks. Blocks should be cut such that the resultant joint width remains within the 2-6mm tolerance. When laying to tight curves it may not be always possible to maintain a maximum 6mm joint, in which case, cut or special shaped units may have to be considered.

Maintenance
In brief, Marshalls would recommend:

- Inspect at least twice a year, spring and autumn, and/or after a major storm
- Brush the surface to remove debris and encrusted sediment
- Maintain the area to be free of vegetation
- Replenish the joints when empty
- Ensure that the owner is aware of the pavement construction and the "do's and don'ts" of the system

Further Information
For technical advice on commercial installations, or when confronted by unusual problems or circumstances, please contact Marshalls Technical Advisory Services on 0370 411 2233, or by email on advisory.services@marshalls.co.uk

CONDITIONS AND GUIDELINES

Definition of scope

In some parts of the country there are ground conditions where infiltration could adversely affect foundations to houses, therefore, if in doubt seek advice from a specialist or the local authority building control department.

Domestic Priora is only intended for domestic driveways, paths and patios which are subject to foot traffic or over-run by typical domestic vehicles that do not exceed a gross vehicle weight of 3.5 tonnes, although occasional use by heavier delivery vehicles should not have a detrimental effect.

The domestic Priora system is only intended for driveways or path where infiltration only is required in which the area must drain itself only and no other surrounding paved or roofed areas.

Properties constructed pre-1920's may not have been built on a concrete foundation; therefore, if this is proved to be correct, then the Marshalls' domestic Priora system should not be installed.

Soil strength

Marshalls' domestic Priora system must be either installed on a sub-grade which has previously had an established existing driveway* or on an area which has sub-grade soil strength greater than 5%

Laying onto a sub-grade which has previously taken an established driveway proves that the sub-grade was able to take the driveway construction. The standard designs are based on conditions where the sub-grade is greater than 5%, therefore, this is mirrored in our advice

Rock or Soil Type	Condition	Simple field test	CBR
Rock	Hard	Requires mechanical pick for excavation	Above 5%
Sand Gravel	Compact	50mm square peg hard to drive in 50mm	> 5%
Clay Sandy Sandy Clay	Stiff	Cannot be moulded by fingers Need pick for excavation	5% - 2%
Clay Sandy Clay	Firm	Can be moulded by fingers Need spade for excavation	5% - 2%
Sand Silty Clay Clayey Sand	Loose	Dry lumps easily broken down 50mm square peg driven in easily	2%
Silt Sandy Clay Silty Clay Clay	Soft	Can be easily moulded by fingers	<2%

Silt	Very soft	Exudes between fingers when squeezed seek advice
Sandy Clay Silty Clay Clay		

The CBR of the rock or soil is significantly affected by moisture

Soil permeability

The domestic Priora system is only suitable for soil areas where infiltration applies and the test criteria have been met according to the standard permeability test. For the standard permeability test, a test hole should be dug for every 20m² of driveway. There should be a minimum of two holes. Holes/pits should be spaced evenly in relation to the proposed Priora area. The soil test is the key. If the sub-grade soil is not permeable then domestic Priora cannot be installed.

Surface gradient

- The intended Priora area must fall away from the property. The top surface of the driveway should finish at least 150mm below any adjoining DPC level.
- The area should also fall away from all properties and buildings.
- If the intended Priora system falls to the house, then depending on the gradient, water could discharge and pool in and around areas of the house structure. This could lead to damp areas appearing on the masonry leaf.
- If the driveway exceeds 20m in length and has a gradient greater than 1 in 100, then please contact the Technical Advisory Services Department for assistance.
- Depending on the gradient in relation to the length, additional construction processes will be required by the provision of baffles.

Discharge onto roadway

The domestic Priora area must not discharge onto surrounding public roadways and pathways or towards any buildings

Existing foundations

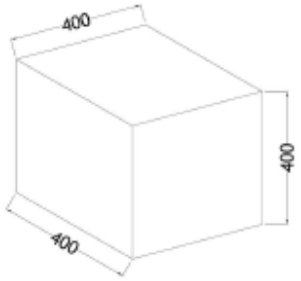
If the property lies adjacent to or is less then 600mm from the proposed domestic Priora driveway area, establish the depth of the house foundation before undertaking any soil test or Priora installation. The house foundation top surface must be a minimum of 600mm below the finished level of the Priora surface. The foundations area must not be disturbed as the integrity of the building may be affected over time. The level of water discharge must be above the level of the foundations to avoid instability at foundation level.

Rainwater catchment area (Driveway area)
No adjoining surfaces areas (rainwater pipes, roof areas etc) must drain onto and into the Priora driveway area. However, small areas, such as door steps and garage areas are acceptable providing that they don't exceed 5% of the driveway area.
If other areas are drained in addition to the driveway area then the hydraulic calculation will dictate the depth, thus increasing the 150mm depth for the 20mm open graded material.

Trees
When installing close to existing trees, tree roots smaller than 25mm diameter may be pruned back, preferably to a side branch, using a suitable pair of secateurs or hand saw. Roots larger than 25mm should only be severed following consultation with an arboriculturist, as they may be essential to the tree's health and stability. Protection of the pavement will also be required, hence the requirement of a permeable root barrier system, such as the Geoweb bio-barrier system (Fiberweb) or similar, which is non-surface protruding, so does not present a trip hazard once installed. Integrity of the pavement installation and intended life may be affected by the ingress of roots.

SOIL PERMEABILITY – based on the BRE Digest 365 test procedure

- Remove topsoil/paving material to exposed sub-grade soil
- Dig hole within sub-grade soil to the size shown below, ensure that all sides and the bottom surface of the hole are trimmed and levelled accordingly



- Fill hole with water and allow to drain away naturally. Repeat this process 3 times. If the water does not drain away at all then the sub-grade soil does not have adequate permeability properties

All pre-test and test work must be carried out for every 20m^2 of driveway. There should be a minimum of two holes, equally spaced throughout the intended area to be paved. Due to the maximum length of time that the test may take, the time of day should be considered.

Fig 16 – JDP BRE Soakaway calculations

J D P Limited		Page 1
Townfoot Longtown, Carlisle Cumbria CA6 5LY	2108-37 Drummore, Drigg Road Seascale, Cumbria 10.8m x 1.2m x 0.42m	Micro Drainage
Date 10/08/2021 File 2108-37 Drummore, Drigg...	Designed by CLP Checked by THo	
Micro Drainage	Source Control 2014.1	

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 11 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	9.323	0.323	4.2	4.0	O K
30 min Summer	9.370	0.370	4.5	4.6	O K
60 min Summer	9.370	0.370	4.5	4.6	O K
120 min Summer	9.312	0.312	4.2	3.8	O K
180 min Summer	9.246	0.246	3.9	3.0	O K
240 min Summer	9.189	0.189	3.6	2.3	O K
360 min Summer	9.108	0.108	3.2	1.3	O K
480 min Summer	9.061	0.061	3.0	0.8	O K
600 min Summer	9.047	0.047	2.7	0.6	O K
720 min Summer	9.041	0.041	2.4	0.5	O K
960 min Summer	9.033	0.033	2.0	0.4	O K
1440 min Summer	9.025	0.025	1.5	0.3	O K
2160 min Summer	9.019	0.019	1.1	0.2	O K
2880 min Summer	9.015	0.015	0.9	0.2	O K
4320 min Summer	9.011	0.011	0.7	0.1	O K
5760 min Summer	9.009	0.009	0.5	0.1	O K
7200 min Summer	9.008	0.008	0.5	0.1	O K
8640 min Summer	9.007	0.007	0.4	0.1	O K
10080 min Summer	9.006	0.006	0.4	0.1	O K
15 min Winter	9.321	0.321	4.2	4.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	109.026	0.0	14
30 min Summer	76.028	0.0	22
60 min Summer	50.812	0.0	40
120 min Summer	32.787	0.0	72
180 min Summer	24.940	0.0	104
240 min Summer	20.347	0.0	134
360 min Summer	15.256	0.0	192
480 min Summer	12.419	0.0	248
600 min Summer	10.576	0.0	306
720 min Summer	9.268	0.0	366
960 min Summer	7.516	0.0	490
1440 min Summer	5.579	0.0	734
2160 min Summer	4.128	0.0	1088
2880 min Summer	3.328	0.0	1440
4320 min Summer	2.452	0.0	2172
5760 min Summer	1.978	0.0	2904
7200 min Summer	1.674	0.0	3584
8640 min Summer	1.461	0.0	4248
10080 min Summer	1.303	0.0	5136
15 min Winter	109.026	0.0	14

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Townfoot Longtown, Carlisle Cumbria CA6 5LY	2108-37 Drummore, Drigg Road Seascale, Cumbria 10.8m x 1.2m x 0.42m	
Date 10/08/2021 File 2108-37 Drummore, Drigg...	Designed by CLP Checked by THo	
Micro Drainage	Source Control 2014.1	

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	9.356	0.356	4.4	4.4	O K
60 min Winter	9.330	0.330	4.3	4.1	O K
120 min Winter	9.231	0.231	3.8	2.9	O K
180 min Winter	9.146	0.146	3.4	1.8	O K
240 min Winter	9.082	0.082	3.1	1.0	O K
360 min Winter	9.044	0.044	2.6	0.5	O K
480 min Winter	9.036	0.036	2.1	0.4	O K
600 min Winter	9.030	0.030	1.8	0.4	O K
720 min Winter	9.027	0.027	1.6	0.3	O K
960 min Winter	9.022	0.022	1.3	0.3	O K
1440 min Winter	9.016	0.016	1.0	0.2	O K
2160 min Winter	9.012	0.012	0.7	0.1	O K
2880 min Winter	9.010	0.010	0.6	0.1	O K
4320 min Winter	9.007	0.007	0.4	0.1	O K
5760 min Winter	9.006	0.006	0.3	0.1	O K
7200 min Winter	9.005	0.005	0.3	0.1	O K
8640 min Winter	9.004	0.004	0.2	0.1	O K
10080 min Winter	9.004	0.004	0.2	0.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	76.028	0.0	23
60 min Winter	50.812	0.0	42
120 min Winter	32.787	0.0	76
180 min Winter	24.940	0.0	106
240 min Winter	20.347	0.0	134
360 min Winter	15.256	0.0	186
480 min Winter	12.419	0.0	244
600 min Winter	10.576	0.0	306
720 min Winter	9.268	0.0	368
960 min Winter	7.516	0.0	484
1440 min Winter	5.579	0.0	738
2160 min Winter	4.128	0.0	1080
2880 min Winter	3.328	0.0	1436
4320 min Winter	2.452	0.0	2176
5760 min Winter	1.978	0.0	2832
7200 min Winter	1.674	0.0	3560
8640 min Winter	1.461	0.0	4384
10080 min Winter	1.303	0.0	5160

J D P Limited		Page 3
Townfoot Longtown, Carlisle Cumbria CA6 5LY	2108-37 Drummore, Drigg Road Seascale, Cumbria 10.8m x 1.2m x 0.42m	
Date 10/08/2021 File 2108-37 Drummore, Drigg...	Designed by CLP Checked by THo	
Micro Drainage	Source Control 2014.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	1.000
M5-60 (mm)	18.000	Shortest Storm (mins)	15
Ratio R	0.283	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.024

Time (mins) From:	To:	Area (ha)
0	4	0.024

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Townfoot Longtown, Carlisle Cumbria CA6 5LY	2108-37 Drummore, Drigg Road Seascale, Cumbria 10.8m x 1.2m x 0.42m	
Date 10/08/2021 File 2108-37 Drummore, Drigg...	Designed by CLP Checked by THo	
Micro Drainage	Source Control 2014.1	

Model Details

Storage is Online Cover Level (m) 10.000

Cellular Storage Structure

Invert Level (m) 9.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 1.50000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 1.50000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	13.0	13.0	0.421	0.0	22.6
0.420	13.0	22.6			

THE END