

PROPOSED 3 No. DETACHED HOUSES on LAND at PRIORY ROAD, BOLTON upon DEARNE, ROTHERHAM S63 8AE

Approved Plan No. 2016/0705 Mr. Keiron Dunn

Planning Condition 10 – Drainage Details

Foul:

Foul drainage will be connected into the public sewerage manhole located on the site, levels as shown on attached Drawing No.6. The appropriate Notification of Connection to Public Sewer under the Water Industry Act 1991: Section 106 & 102 (Form SZ – SC14) will be submitted to Yorkshire Water Services Ltd. 28 days before any connection is made.

ICs to be 450 dia polypropylene chambers on 150 concrete base with light duty cast iron cover and frames in gardens and 600 x 900 precast concrete sectional chambers on 225 thick concrete bases in the private access road with medium duty cast iron covers and frames.

New drain connections made using 160 or 110 diameter plastic pipes and fittings to BS EN 13476-1:2007 with push fit flexible joints; 160 diameter pipes laid to a minimum gradient of 1 in 60 and 110 diameter pipes laid to a minimum gradient of 1 in 40; shallow pipework less than 500 cover to be bedded and surrounded in 100 thickness of structural concrete; drains passing under buildings to be protected by taking foundations below level of pipework withy concrete lintel to support wall above

Surface Water:

Surface water from dwelling roofs are to connect into 3 No. soakaways, one serving each plot with levels as shown on attached Drawing No.5. . Soakaways to be in the locations shown situated min 5 metres from any structure and 2 metres from any boundary.

110 diameter plastic pipes and fittings to BS EN 13476-1:2007 with push fit flexible joints; surface water laid to a minimum gradient of 1 in 100; shallow pipework less than 500 cover to be bedded and surrounded in 100 thickness of structural concrete;

ICs to be 450 dia polypropylene chambers on 150 concrete bases with light duty cast iron covers and frames

Percolation test carried out as described below and calculations attached to determine size and construction of soakaway to be employed.

Trial holes have demonstrated that the permeability of ground is satisfactory, so surface water from paved areas will discharge to ground via permeable block paving to both the access road and house driveways.

As there is no current or proposed surface water run off from the site connecting to either public sewers or watercourses in the area, the part of the planning condition with respect to limiting surface water run-off has no relevance in this case.

DESIGN CALCULATIONS for SOAKAWAYS AT PRIORY ROAD, BOLTON on DEARNE, ROTHERHAM
APPROVED PLAN 2016/0705 (PLANNING) AND 16/17206/BR (BUILDING REGULATIONS)

Take worst case plot 1: roof area 150m² (Plot 2 = 135m², Plot 3 = 125m²)

A 1100 x 1500 trial pit to a depth of 1200 was excavated 29th January, 2017 and tests undertaken 30th January, 2016. The trial hole was filled with water to 600mm total depth and left overnight; no water remained in the excavation at start of test.

A 300 x 300 x 300 testing hole was excavated at the bottom of the trial hole to allow percolation tests to be undertaken and calculation of soil infiltration rate

GROUND CONDITIONS

The trial hole consisted of 200mm thickness of topsoil overlying a non-cohesive material throughout the depth of the excavation (Photograph 1). This material consisted of sandy clay with small pieces of broken sandstone (Photograph 2). There was no groundwater in evidence.

TEST RESULTS

Length of trial pit 300mm: Width of trial pit 300mm: Depth of trial pit (below invert) 300mm

$$75\% \text{ depth of trial pit} = d_{75} = (d_{\text{trial}} \times 0.75) = 225\text{mm}$$

$$50\% \text{ depth of trial pit} = d_{50} = (d_{\text{trial}} \times 0.50) = 150\text{mm}$$

$$25\% \text{ depth of trial pit} = d_{25} = (d_{\text{trial}} \times 0.25) = 75\text{mm}$$

Test 1 – time to fall from 75% to 25% effective depth – 18 minutes

Test 2 – time to fall from 50% to 25% effective depth – 15 minutes

Test 3 – time to fall from 75% to 25% effective depth – 15 minutes

Longest time to fall from 75% depth to 25% depth = $t_{lg} = \max(T1, T2, T3) = 18 \text{ mins}$

$$\text{Storage volume from 75\% to 25\% depth} = V_{p75_25} = (l_{\text{trial}} \times b_{\text{trial}} \times (d_{75} - d_{25})) \times V_{\text{trial}} = 0.01\text{m}^3$$

$$\text{Internal surface area to 50\% depth} = a_{p50} = ((l_{\text{trial}} \times b_{\text{trial}}) + (l_{\text{trial}} + b_{\text{trial}}) \times 2 \times d_{50}) = 0.27\text{m}^2$$

$$\text{Surface area of soakaway to 50\% storage depth} = A_{s50} = 2 \times (l_{\text{trial}} + b_{\text{trial}}) \times d_{\text{trial}}/2 = 0.180\text{m}^2$$

$$\text{Soil Infiltration rate} = f = V_{p75_25} / (a_{p50} \times t_{lg}) = 46.2 \times 10^{-6}$$

Rectangular pit design

Pit length $l = 1.500$

Pit width $w = 1.500$

Pit depth below invert $d = 1.000$

Free Volume $V_{\text{free}} = 100\%$

Location of soakaway = England

Return Period 10 years

Ratio of 60 minutes to 2 day rainfalls of 5 year return period (BRE Digest 365 = Fig 1) $r = 0.35$

Impermeable area = 150m²

Soil Infiltration Rate $f = 0.0000462 \text{ m/s}$

Surface area of soakaway to 50% storage depth

$$= A_{s50} = 2 \times (l \times w) \times d/2 = 2 \times (1.5 \times 1.5) \times 0.50 = 3.00\text{m}^2$$

Outflow factor

$$= AF = A_{s50} \times f = 3.00 \times 0.0000462 = 126 \times 10^{-6}$$

M5 rainfall as calculated from Table 1 of BRE Digest 365, using Factor Z1

Storm Duration	M5 Rainfall	G Factor Z2	M10 Rainfall	Inflow m ³	Outflow m ³	Storage Required
10	10.2	1.22	12.4	1.85	0.22	1.63
45	12.4	1.23	15.3	2.29	0.34	1.95
0	15.8	1.24	19.6	2.94	0.68	2.26
60	20.0	1.24	24.8	3.71	1.36	2.35
120	24.4	1.24	30.3	4.54	2.72	1.82
240	30.0	1.22	36.6	5.48	5.44	0.04
360	33.8	1.21	40.9	6.14	8.16	0
600	39.0	1.19	46.6	6.99	13.6	0

Required Storage Volume = 2.35m³

Soakaway Storage Volume = l x w x d = 1.5 x 1.5 x 1.05 deep = 2.35m³

Time for emptying soakaway to half volume

= $T_{50} = S_{Req} \times 0.5 / A_{50} \times f = 2.35 \times 0.5 / 3.00 \times 0.000042 = 2 \text{ hrs } 36 \text{ mins}$

For safety in inspection and allow maintenance works and to achieve 100% free volume calculate equivalent volume in 1500 diameter precast porous concrete soakaway unit.

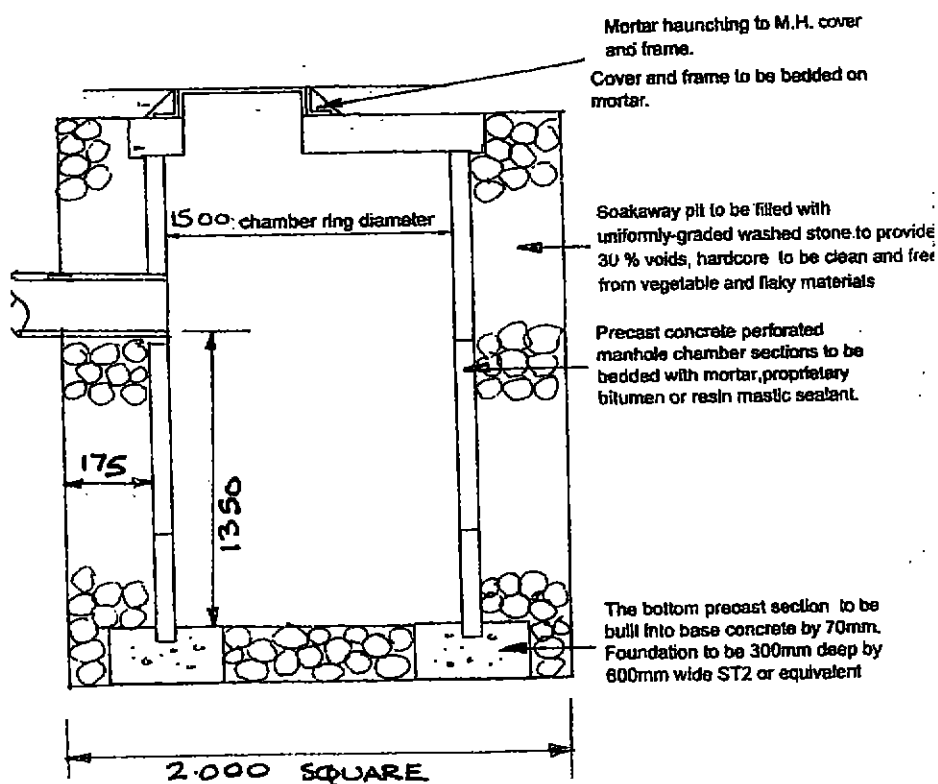
$d = 2.35 / 0.75 \times 0.75 \times \pi = 1.350$ below invert: Therefore: Total 2.000 deep chamber as detail

Additional storage provided by filter media surrounding chamber

= Volume of excavation below invert less area of soakaway chamber x 30% free volume of fill

= $(2.00 \times 2.00 \times 1.35) - 2.35 \times 0.30 - 2.35 = 0.92 \text{ m}^3$

Soakaway Manhole





Photograph 1 Trial Hole



Photograph 2 Excavated Material

ACCESS ROAD

Trial holes have demonstrated that the permeability of ground is satisfactory, so roofs go to soakaways as calculation above. No surface water from paved areas will discharge to public sewerage system as a permeable block paving is to be used for both the access road and house driveways.

Paving Construction

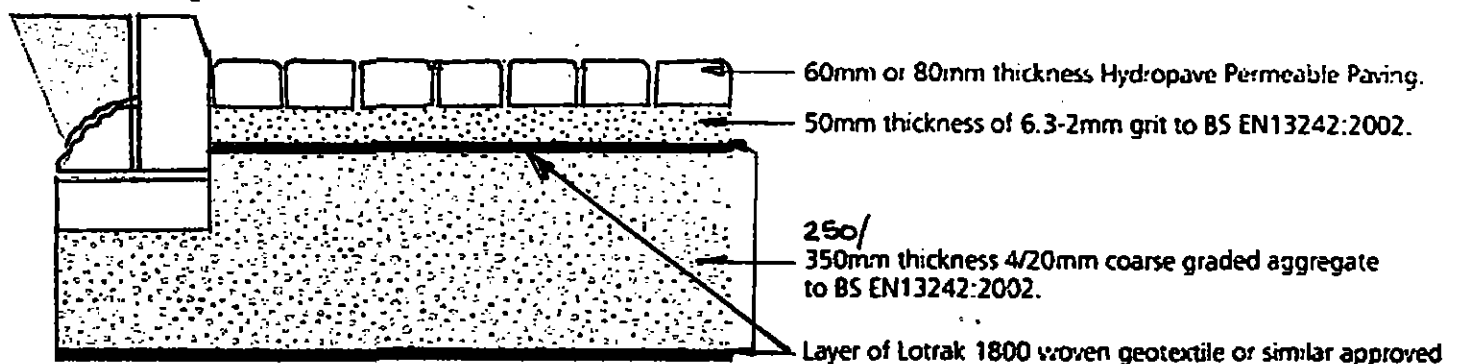
Blockwork paving is to be 60mm thick Marshall's "Driveline Priora" Brindle permeable blocks (or equivalent). A sample of the final choice and colour will be submitted to the Local Planning Authority for approval before construction of paving starts on site.

Sub-base of 350mm thick bed to access road and 250mm thick bed to driveways of 20mm clean crushed limestone to BS EN 13242: 2002, laid in 150mm lightly compacted layers on geotextile membrane; membrane overlapping at joints by 300mm. 50mm thick base layer of 20-6mm clean graded angular aggregate of open graded crushed rock or open graded crushed gravel to BS EN 13242: 2002 on a second layer of geotextile membrane; lower membrane brought up to the haunched edging and cut-off flush with the surface of the paving. Blocks vibrated with a vibrating plate and 2-6mm clean quartzite or gritstone applied to the surface and brushed into joints with additional compaction upon completion.

Blocks laid in herringbone pattern and to be restrained at edges with 150 x 50 precast concrete edging stones to BS EN 1340 laid on 150 concrete bed and back haunch; double stretcher course of blocks used around the periphery of the paved areas.

Sketch Plan of Paving

Conventional edge restraint





Photograph 3 – Location of Trial Hole



Photograph 4 –Trial Hole 06/02/2017 after rainfall

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Planning Condition 13 – Construction Method Statement

Measures to control the emission of dust and dirt during construction

Dust emissions and dirt contamination arising from a site can potentially annoy neighbours and even cause health risks. Under the Environmental Protection Act 1990 the contractor has a duty to avoid causing a statutory nuisance due to creating dust that may affect the workforce, neighbours and the environment. The BRE 'Control of Dust from Construction and Demolition Activities' 2003, gives best practice guidance on the control of dust and vehicle fumes and will be implemented and followed as much as possible.

All operatives on site will be made fully aware of this fact dust is a statutory nuisance and who may be affected by the works.

To minimise the nuisance of dust generated by the construction operations the following operational constraints will be implemented:

- The monitoring of operations with the potential to cause airborne dust emissions will be regularly undertaken by the contractor, this will predominantly take the form of visual assessments.
- Provide a length of paved road before the exit from the site as soon as possible to reduce the transfer of dirt from the site and provide a proper wheel washing area. Prior to any vehicles leaving the site, they will be inspected with regards to their being free from excessive dirt, mud and other contaminants. If they are not free from any of these, then they will be mechanically cleaned to remove any dirt, mud or contaminants from their wheels and undercarriage
- Public roads will be swept regularly when required and when potential traffic movements containing soil, spoil, hardcore, concrete etc. are being taken in or out of the site.
- All dust generating materials transported to and from site will be covered by tarpaulins.
- Traffic speed on site will be restricted to prevent the generation of dust, especially during dry periods.
- Construction methods will be reviewed regularly to limit the generation of dust e.g. wet cutting in lieu of dry cutting where practicable
- The control of dust will be implemented on site by the use of a water bowser unit to dampen the site access area.
- Plant and equipment will be selected to minimise the generation of dust
- Materials will be stored as far away as possible from sensitive boundaries whenever possible
- During very dry conditions consideration will be given to suspension of soil handling operations if wind speeds give rise to dust generation which could cause a nuisance to dust sensitive locations in the vicinity of the site, particularly during dry and windy conditions.
- All personnel working in a dusty area shall, where necessary, wear a dust mask deemed suitable by the HSE (Health and Safety Executive)
- Any rubbish skips which have dusty materials stored will be sheeted or lidded

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Planning Condition 13 – Construction Method Statement (continued)

Measures to control the emission of noise levels during construction

Noise under the Control of Pollution Act 1974, Part 3, Environmental Protection Act of 1990 and the Noise Regulation Act, recognised noise is a form of pollution and as such can be classified as a nuisance. BRE 'Control of Dust from Construction and Demolition Activities' 2003 gives additional guidance and its recommendations will be utilised as much as possible during the construction work. Every workman on site will be made aware that they have a responsibility to see that activities are carried out in the quietest practicable manner.

To minimise the nuisance of noise generated by the construction operations the following operational constraints will be implemented

Site operatives to be trained to ensure that noise minimisation construction methods are implemented.

The use of super silenced plant where feasible.

Well-maintained modern plant will be used throughout the construction period.

Methods of construction will be assessed to reduce the need to adopt percussive and vibrating machinery.

Stationary vehicles and plant not in use will not be left with engines idling.

Drop heights will be minimised during deconstruction operations.

Working hours will be restricted as required by Condition 7 of the Planning Approval made by the Local Authority.

Where any person is liable to be exposed to noise levels greater than 80 dB (A), they will be provided with suitable ear protection such as ear plugs, ear muffs and noise attenuation helmets.

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Planning Condition 3 – Materials

Plot 1 - Moray Red Mixture Brick by Forterra Building Products Limited.

Plot 2 - South Down Multi Brick by Forterra Building Products Limited.

Plot 3 - Wentworth Mixture Brick by Forterra Building Products Limited.

All Plots - Forticrete Minislate Slate Grey concrete interlocking roof tiles.

Paving to private access road and driveways to be Marshall's "Driveline Piora" Brindle permeable blocks with precast concrete edging stones.

Planning Condition 4 – Boundary treatments

Boundaries:

Western boundary with Nos. 25 to 29 Priory Road to be a 225 wide x 1000 high brick boundary wall in Moray Red Mixture facing bricks by Forterra Building Products Limited.

North, south and eastern boundaries and plot boundaries to have timber screen fencing totaling 2.100 metres in height with 1830 long x 1800 high timber panels supported in 94 x 109 slotted concrete fencing posts with 305 x 50 smooth concrete gravel boards at the base.

Gate: electrically operated 2000 high steel frame with timber infill security gate to match existing gates on adjacent development.

Planning Condition 5 – Site Levels

Drawing No. 7 attached shows the existing and proposed site and floor levels including adjacent property floor levels.

Planning Condition 9 - Vehicular and Pedestrian Gradients

Maximum gradient for vehicle and pedestrians on site is 1 in 46 at entrance to site.

Planning Condition 10 - Drainage

Drawing No. 6 attached showing drainage layout and levels. Drainage report attached including permeability test and soakaway calculations.

Planning Condition 12- Arboriculture Report

Report prepared by arboriculture expert including method statement and protection plan for tree to remain attached.

Planning Condition 13 – Construction Method Statements

Method statements with respect to emission of dust and dirt and noise control measures attached.