Location of percolation test

Crate Soakaway beneath the permeable roadways to alleviate flash flood events

9m 'exclusion zone' for IDB access

Headwall outfall to ex watercourse. Discharge to Royal Commission Standards

Headwall detail to IBD Specification

Grassecrete Walkway

Package Sewage Treatment Plant

50m
40
30
20
10
0m

600mm DIAMETER BALANCING CULVERT BETWEEN THE TWO NEW LAKES

Indicates crated soakaways

NOTES

Do NOT scale from this drawing or any other prepared by JDA in connection with this project
This drawing is copyright and may not be altered, traced, copied, photographed or used for any purpose other than for which it has been issued without written permission of the copyright holder.
The Contractor is to check all dimensions on site and report any discrepencies PRIOR TO commencing work.
All details shown on this drawing are based upon typical site conditions relatedto the area. No respobility can be accepted for abnormal conditions unless theyhave been reported in detail so that design amendments may be considered.
All works and materials are to be in full accordance with current British Standards, Building Regulations, Agrement Certificates and Manufacturers printed instructions.
All Building Regulations inspections are to be carried out at the appropriate stages of work.





Percolation Tests

Soakage Test :

This test was carried out to determine the infiltration characteristics of the soil and was carried out as follows:
A trial hole was dug to determine the position of the standing ground water table which was not encountered at a max excavation depth of 1.5m.
The ground water table (not found) did not rise to within 1.05m of the invert level of the proposed distribution pipes.
A hole 300 m square was excavated to a depth 300mm below the proposed invert level of the incoming drainage pipe.(Design rainfall intensities of 0.014 litres/ second/mC may be assumed for normal situations).
A singlerial holes was dug. The 300mm square section of the hole was filled with water to a depth of at 300mm allowed it to seep away overnight.
Next day, the 300mm square section of the holes were again filled with water to a depth of 300mm and time observed, in seconds, for the water to seep away from 75% full to 25% full level (i.e. a depth of 150mm).
Divide this time by 150mm giving the average time in seconds (Vp) required for the water to drop 1mm. In this case - average 60mins divided by 150mm = 24 seconds (Vp = 24 seconds)
The test was carried out three times with the trial hole see plan. The average figure from the tests was taken. The test was not carried out during abnormal weather conditions such as heavy rain, severe frost or drought.
For small soakaways serving 25m2 or less, a design rainfall of 10mm in 5 minutes is quoted in the Building Regulation Approved Document H as being an appropriate worst case. The maximum area in this case is 25 sq m.
Drained area (typical) = 25m2
Incoming water is 25m2 area x 10mm of rainfall = 0.25m3 of water to be disposed of.
f = 10-3 / 2 x 24 (Vp , in seconds from above)
Outflow volume is: O = as50 x f x D therefore O = 2 x 0.0002 x 5 and thus O = 0.002m3
Therefore required capacity is 0.25m3 - 0.002m3 = 0.248m3. Which means that a traditional rubble filled soakaway measuring 1m3 below the inlet pipe and with, say, 20% void, i.e. 0.2m3 storage capacity, will not be adequate and the soakaway volume should therefore be 1.30m3 capacity.
Solution :
Use proprietary modular attenuation cells (lightweight plastic structures wth high void ratio) - Polystorm by Polypipe or similar approved by Building Control
Driveline Priora permeable paving by Marshalls to be used for the new driveways - these areas were therefore NOT included in the soakaway design - however, soakaways have been indicated for the private driveway to mitigate against a flash flood situation.

Order of priority
A soakaway
A watercourse
A sewer
Notes
As with foul drainage, the Regulations now specify an order of priority for methods of disposal. The effect of this is that applicants can no longer simply choose to discharge rainwater to a sewer - even where a separate surface water sewer exists. If it is reasonably practicable to use either a soak away or a watercourse - then applicants must do so.
Soakaways need to be designed. Details of rainwater intensity, porosity tests and storage capacity are now included in the Approved Document, as are details of swales, filter drains and detention ponds that may also be used.
The effective roof areas, for any given roof pitch, have been changed. Gutter sizes may therefore need to increase accordingly.
Syphonic and eaves drop systems are now included in the Approved Document guidance.
Certain paved areas (disabled access routes, common access areas and routes to waste bins) must either be free draining (away from buildings) or pervious to allow water to soak away. If this is not possible then gullies/channels need to be provided.
Areas that may produce contaminated drainage need to be kept separate for treatment. For example, areas that may be affected by petrol or oil spillage should drain in the first instance to an oil interceptor.

RAINWATER DRAINAGE
Rainwater goods to be new 110mm UPVC half round gutters taken and connected into 68mm dia UPVC downpipes. Rainwater taken to new soakaway, situated a min distance of 5.0m away from any building, via 110mm dia UPVC pipes surrounded in 150mm granular fill.

UNDERGROUND FOUL DRAINAGE
Underground drainage to consist of 110mm diameter UPVC proprietary pipe work to give a 1:40 fall laid on 100mm granular bed conforming to BS882 1983, Table 4 and selected as-dug backfill to 1 in 40 gradient to mains connection. Provide 600mm suitable cover (900mm under drives). Shallow pipes to be covered with 100mm reinforced concrete slab over compressible material. Provide rodding access at all changes of direction and junctions. All below ground drainage to comply with BS EN 1401-1: 2009.
Drains with less than 900mm cover under roads/parking to have reinforced concrete bridging over. Drains with less than 600mm cover not under roads/parking to have concrete paving slabs as bridging over pipes with 75mm granular fill between top of drain and underside of slabs. PVCU rest bends to base of soil stack and trapped back inlet gulley (low-back P-trap and square hopper) bedded and surrounded with 100mm concrete. 450mm dia. polypropylene inspection chambers bedded on selected as-dug material with cover and frame. Class A15 (BS-EN 124) cover and frame in paths and planted areas. Class B125 (BS-EN 124) cover and frame in road and parking areas. Concrete bed and surround to cover frames. Lightweight inspection chamber covers to be of screw down type.
Drains under building encased in 25mm fibreglass and 100mm concrete, cast integrally with floor slab where crown within 300mm of slab underside.
Flexible drain joint to be provided within 150mm of entering building and within 150mm of inspection chamber connection, followed by 600mm long 'rocker' pipe.
Protect drains passing through walls from differential settlement with 25mm fibreglass wrap and lintel over.
Fill drain trenches with concrete where within one metre of building and lower than foundation, up to lowest level of foundation. Where further than one metre from building, fill drain trench with concrete up to level below foundation equal to distance from building less 150mm.

Excavating / Backfilling ;
Lower part of trench :-
From bottom to 300m above crown of pipe the trench must have vertical sides and be of a width as small as practicable but not less than external diameter of pipe plus 300mm or larger dimension if specified.
Formation for beds generally :-
Excavate to formation immediately before laying beds or pipes. Remove mud, rock projection, boulders and hard spots and replace with consolidated bedding material. Harden local soft spots by tamping in bedding material.

WATER EFFICIENCY
The estimated water consumption not to exceed 125 litres per person per day in accordance with Approved Document G2 (or 110L per-person if required by the planning conditions) . Water Efficiency to be calculated using the 'Water Efficiency Calculator for New Dwellings' or from the list of fitting from the 'Table of fittings' in ADG to comply with part G. The results submitted to building control before works commence on site.

Water calculation to be in compliance with Code for Sustainable Home Level 3/4 as stipulated by the local Planning Authority. Example calculation below;
WC 5/3 (dual flush)
Taps (excluding kitchen taps) 4
Baths 180
Shower 8
Kitchen sink taps 6
Washing machine 8.17 (not supplied)
Dishwasher 1.25 (not supplied)
Water recycling 0 (not supplied)
Predicted per capita consumption (Code) 103.28

WASTEWATER HEAT RECOVERY SYSTEM (WWHRS) – ALL UNITS
All showers to connect to instantaneous WWHR with 36% recovery efficiency utilization of 0.98, including showers over baths as detailed in the SAP report.
Recovery system and components to be independently tested and assessed by BRE. All works to be in compliance with Approved Document H and L.
All boxing off to be accordance with NHBC standards and Approved Document E.
Installation and water fittings to be compliant with The Water Supply Regulations 1999 and BS 6920.
Design stage checklist to be completed and system to be installed and commissioned by a qualified plumber. Operational and maintenance instructions to be given to owner on completion.
System to have factory fixed NCM (SAP) Identifier label. An identical second NCM (SAP) identifier label is also required to a nearby service cupboard.
System to be installed vertically so that it is fitted on the floor below the shower.
WWHR units to be installed inside the building
WWHR unit and the drain connector to have min 10mm clearance from the any adjacent structure.
WWHR system not to be installed in an environment where the ambient temperature in naturally above 25oC to minimise the risk of legionella growth.
Supply temperature of at least 60oC to be maintained from the heat source and/or storage vessel.
An Approved single check valve prevention device providing backflow prevention to at least fluid category 2 to be fitted at the point of connection(s) between the water supply and the fitting or appliance.
Length of drainpipe between shower and WWHR system to be less than 3 meters as far as practicable.
Access points to be provided.
Any shut-off valves for inlet and/or outlet to be full flow (non-restricting) shut off-valves.
WWHR pipe to be the same nominal size as the waste pipe to which it is connecting.
Pipework between the WWHRS preheated water outlet and the water heater and the shower cold-water inlet(s) to be insulated in accordance with the specification for DHW primary circulation pipes defined in 'Domestic Building Services Compliance Guide'.



Headwall inlet into lakes

EXTERNAL SURFACE WATER DRAINAGE
Drainage of paving areas to be carried out in accordance with BS 6367:1983 and Approved Document H.
Hard surfaces around the building should be provided with a proprietary non slip permeable surface laid to manufactures details and in compliance with BS6717, to allow adequate drainage or provided with a non slip surface and cross fall of 1:40 – 1:60 draining away from the building (for a minimum of 500mm) to a suitable soakaway.
Paths, driveways and other narrow areas of paving should be free draining away from any buildings to a pervious area such as grasslands or to a suitable soakaway.

INSPECTION CHAMBERS
Generally, underground quality proprietary UPVC 450mm diameter inspection chambers to be provided at all changes of level, direction, connections and every 45m in straight runs. Inspection chambers to have bolt down double sealed covers in buildings and be adequate for vehicle loads in driveways.
Inspection chambers to be located as shown on drawings.
Exact depth and size to be agreed on site with Building Inspector.
For chambers with inverts of less than 900mm use Hepworth preformed polypropylene chambers or equal approved.
Other chambers to be formed in brickwork.
Inspection chambers with inverts greater that 900mm to be purpose built as follows : 225mm thick brick walls in semi-engineering brick laid in English Bond. Bricks with frogs to be laid with frogs uppermost.
Heavy duty covers and frames in roads and parking areas, medium duty elsewhere.
Joints to be formed with waterproof mortar and to be flush and smooth.
Walls to be built of minimum 150mm thick concrete base and dimensions not less than outside dimensions of chamber.
Exact depth and size of chambers to be agreed on site with Building Inspector.
Back inlet gullies to be bedded and surrounded in 150mm concrete. Gullies to be roddable.
Connection to off-site sewers to Local Authority details.

Manhole Covers and Frames ;
The manhole covers and frames for roads shall be the heavy duty cast iron non-rocking three point suspension type, constructed in tow triangular section and linked together with mild steel bolts,
all in accordance with BS.497 (Grade A). They shall be to BS Ref : MA60 or have a 600mm x 600mm clear opening and be ither Drainage Castings "Silent Knight" range, cast iron No. DC5037 (Broads No. 70C) or ductile iron No. DC5050 or Stanton and Staveley "Chieftain" ductile
iron SS118 or Drainage Castings "Dreadnought" range ductile iron No DC50553,
The medium duty pattern manhole covers and frames for fitment off roads shall be of cast iron and weigh not less than 100kg (2cwt), all in accordance with BS.497 (Grade B).
They shall be of the circular type to give clear opening of 600mm (24") or may alternatively be to BS Ref : MB2 – 60/60 with 600mm x 600mm clear opening.

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Proposed Holiday Home Development at ;
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Drawing Title : Site Layout - DRAINAGE

Scale 1 to 500 at A2 Portrait

Date April 2023

Drawing No JDA/2023/885/DRAINAGE.001

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