





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 over not under roads/parking to have concrete parking so have 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 300nn 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

UTLITY TRENCHES NEAR TREES

Hand Dig Method of Excavation within the Root Protection Area of the Tree or Trees for Installation of Pipe Work (if required)

Where installation of pipe work for water, electricity, gas or drainage purposes needs to be undertaken within the root protection zone of the trees, a hand dig method of excavation will be undertaken.

Where possible the route and locations of such pipes/features should be kept at the furthest possible point from the location of the tree to minimise damage to the trees roots, ideally this should be out of the RPA.

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Proposed Development at Hill House, Wicken Road, Clavering CB11 4QT

Drawing Title : Proposed Site Layout with Drainage

Date : January 2024

Scales 1 to 250 at A3 Portrait

Drawing No JDA/2023/925/DRAINAGE.001

108.81 EXTERNAL SURFACE WATER DRAINAGE Drainage of paving areas to be carried out in Shed accordance with BS 6367:1983 and Approved Document H tm CB Fencing 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 2 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 paying should be free draining away from any buildings to a pervious area such as grasslands or to a suitable soakaway. • 703.80 The proposed access has pedestrian visibility splays of 2m x 2m at the access point with no obstructions over 600mm high within the permeable visibility splays. pavoirs Vehicle to vehicle visibility splays are x - x = 2.4m and x - y = 43mH 1 ۲ •••^{*} 2.0 x 2.0m Pedest Visibility Splays MANHOLE NO 4801 access from metalled vehicular assumed ex FW Sewer access and dropped kerb to the lateral connection existing footnaff to ex FW Sewer Fence - Closeboard 105.49

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

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/mÇ may be assumed for normal situations).

Two trial holes wer dug. The 300mm square section of the holes 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 = 25m2

Incoming water is 25m2 area x 10mm of rainfall = 0.25m3 of water to be disposed of

 $f = 10-3/2 \times 24$ (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 $0.25m_3 - 0.002m_3 = 0.248m_3$. Which means that a traditional rubble filled soakaway measuring 1m₃ below the inter type 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

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