

**1. CIVIL ENGINEERING NOTES GENERAL**

- 1.1 Do not scale from this drawing.
- 1.2 This drawing is to be read in conjunction with all other drawings and specifications associated with this project.
- 1.3 Topographical survey information is based on the Land Survey undertaken by J.BROTHERTON'S topographical land survey drg. no. 14059 dated December 12.05.14.
- 1.4 The development layout has been taken from Calforseaden's project number K160423 & drg. no. (0)101 rev 4 dated 12.12.16.
- 1.5 The approximate location of utility mains and services has been reproduced from utility company records. Calforseaden cannot therefore guarantee the accuracy of this information.
- 1.6 It is the Contractor's responsibility to record the position, size, depth, material and type of all existing utility mains and services [e.g power, gas, telecoms, water, sewerage] in close proximity to the proposed works prior to construction commencing on site.
- 1.7 It is the Contractor's responsibility to check all levels and setting out information prior to construction works commencing on site. Any discrepancies must be reported to the project manager immediately.
- 1.8 Signing, lighting and guarding of roadworks shall be undertaken in accordance with Chapter 8 of the Traffic Signs Manual, and the Code of Practice Safety at Street Works and Road Works published by the Department for Transport. Traffic control systems are to be agreed with the Highway Authority and relevant permits obtained. Vehicular and Pedestrian access must be maintained throughout the duration of the works.
- 1.9 New utility services are to be installed in accordance with NJUG Volume 2 "Guidance on the Installation of New Services to Development Sites".

**2. DRAINAGE - DESIGN STANDARDS**

- 2.1 Drainage systems to remain private shall be designed and installed to meet the requirements of BS EN 752, Building Regulation Document H and NHBC standards.
- 2.2 Drainage systems to be adopted under S104 Water Industry Act [WIA] 1991 must be designed and installed to meet the requirements of Sewers for Adoption 6th or 7th Edition.
- 2.3 Sustainable drainage systems [SUDS] must be designed, installed and maintained to meet the requirements of CIRIA Report C753 SUDS Design Manual 2015.
- 2.4 Unless otherwise shown minimum pipe sizes and gradients for drainage systems outside buildings shall be;
  - Foul Water:
    - <=10 Dwellings min 1 WC connected- 100 dia @ 1:80
    - >=10 dwellings- 150 dia @1:150
  - Surface Water:
    - Consult with project manager
- 2.5 Where new branch connections are made within traditional benched chambers, the whole of the benching on that side is to be removed and re-benched.
- 2.6 Drains to be abandoned shall be high pressure jetted and filled with Class G3 grout or removed completely and benching made good in existing manholes.
- 2.7 Pipes of different diameters to be laid soffit to soffit.
- 2.8 Rainwater downpipes connected direct to a drain must incorporate a rodding access fitting above ground level.
- 2.9 Drains runs to be flushed through and debris removed prior to final testing and handover.

**3 DRAINAGE - MATERIALS AND WORKMANSHIP**

- 3.1 All works which are subject to the requirements imposed by Schedule 1 to the Building Regulations should, in accordance with Regulation 7, be carried out with proper materials and in a workmanlike manner. Workmanship should be in accordance with BS 8000 Workmanship on Building Sites Part 14: Code of Practice for below ground drainage.
- 3.2 All works to be adopted under S104 WIA 1991 shall be in undertaken in accordance with Sewers for Adoption 6th or 7th Edition.

**4 CONCRETE**

- 4.1 Standard concrete mixes shall be in accordance with BS EN 206-1 and BS 8500 tables A.13, A.14, and A.15 with a 20mm nominal maximum size aggregate and a slump class S2 for a target 70mm.
- 4.2 All in situ concrete shall be standard mix gen3 unless otherwise stated.
- 4.3 All structural concrete shall be C28/35 unless otherwise stated.
- 4.4 The concrete design sulphate class and chemical class shall be to BS 8500 and EN 206-1 for the appropriate ground conditions. see geotechnical engineers report.
- 4.5 All cement shall be portland [CEM1] complying with the provisions of BS EN197-1.
  - Mortar - Class M1 or CAT1.12= 1:½:3 [cement:lime:sand]
  - Cement grout - Class G3 = 1:10 [cement:sand]

**5 MANHOLES AND INSPECTION CHAMBERS**

- 5.1 Precast chambers to be in accordance with BS EN 1917.
- 5.2 Polypropylene Chambers to be in accordance with BS EN 13598.
- 5.3 Clay bricks, Calcium Silicate bricks and Precast Concrete masonry units shall comply with the relevant provisions of BS EN 771.
- 5.4 Mortar shall comply with the relevant provisions of BS EN 998.
- 5.5 Ductile fabricated covers and frames shall comply with the relevant provisions of BS EN 124 and be of a non-rocking, non ventilating type. Load Class selection guide;
  - Class A15 Areas inaccessible to Motor Vehicles
  - Class B125 Footway/Pedestrian areas/Driveways
  - Class D250 Gully tops in kerb side channels of road
  - Class D400 Carriageways and road [Heavy Duty]
  - Class E600 Areas imposing high wheel loads
  - Class F900 Areas imposing particularly high loads

**6 PIPES AND FITTINGS**

- 6.1 Gravity pipes and fittings for underground sewerage shall comply with the relevant standards;
  - Vitrified Clay BS EN 295-1
  - Ductile Iron BS EN 598
  - PVC-U BS 4660 & BS EN 1401
  - Thermoplastic structured wall pipes BS EN 13476-1 & WIS-35-01
  - Concrete BS EN 1916 & BS 5911-1
- Note: PVC-U & Thermoplastic pipes which will be adopted must be able to resist jetting pressures of 4,000 PSI.
- 6.2 Pressure pipes and fittings for underground sewerage shall comply with the relevant standards;
  - Ductile Iron BS EN 598
  - Polyethylene [colour black] BS EN 13244-2 & -3

Marker tape to be red PVC and shall be printed with the words "PRESSURE SEWER" in bold capital letters along it's length and shall incorporate a corrosion resistant tracing system for non-metallic pipes.

**7 PIPE BEDDING, SURROUND AND BACKFILL**

- 7.1 Imported Grannular material shall comply with BS EN 1610:1998 Section 5.3.3.1.
- 7.2 Bedding and surround material to be either 10mm single sized for pipes up to 300 dia and 14mm single sized for pipes >300 to 600 dia or graded 20mm down primary granular material or recycled aggregate material to BRE digest 433 Class RCA [ii] or RCA [iii] with a Compaction Fraction Value <0.2.
- 7.3 Selected backfill material should be readily compactable, free from vegetable matter, frozen material, exclude large pieces of clay >100mm and stones >40mm in size.
- 7.4 Main backfill material shall be selected as dug material in soft landscaped areas and Type 1 Granular Sub Base material to SHW Clause 803 in Hard Landscaped areas, compacted in layers not exceeding 250mm in depth. No mechanical compaction should be used until the first 300mm layer has been placed.

**8 CHANNEL DRAINS**

- 8.1 Channel Drains shall be the following type or similar approved, installed in accordance with manufacturer's recommendations;
 

Pedestrian areas	-	ACO Hexdrain
Driveways	-	ACO MD100
Carriageways	-	ACO MD100
Car Parks	-	ACO MD100
- All outlets to be via a proprietary sump unit.

**9 PACKAGE PUMPING SYSTEMS**

- 9.1. Baufix 200 type U3K pump Unit by Jung Pumpen, or similar approved, to be supplied & installed in accordance with Manufacturer's guidelines.

**10 Pollution Prevention**

- 10.1 The contractor's attention is drawn to the control of pollution provisions in the Water Resources Act 1991. He shall take all necessary precautions to ensure that no polluting discharge either solid or liquid is made to any watercourse or to underground strata and that any work carried out in a watercourse shall be removed immediately it is safe to do so.

**11 EARTHWORKS/LANDSCAPING**

- 11.1 Compaction of fill material shall comply with Clause 612 of the Specification for Highway Works [SHW]. Surfaces to be sown with grass seed shall be reduced to a fine tilth and cleared of stones and extraneous material greater than 50mm in size, the seed shall be sown in the most favorable season, evenly distributed and applied at a rate of not less than the quantities listed below;
  - Level surface - 6g/m<sup>2</sup>
  - Sloping surface - 10g/m<sup>2</sup>

- 11.2 All areas to be top soiled shall be decompacted by ripping to a depth of 100mm prior to topsoil placement.

- 11.3 Reinstatement options shall generally comply with BS4428.

- 11.4 Refer to The Landscape Architect's Specification for details of planting/seeding.

**12 GEOCELLULAR STORAGE STRUCTURES**

- 12.1 Modular Geocellular Storage structures must have British Board of Agreement [BBA] technical approval for construction and must meet the structural design requirements set out in CIRIA Report C690 "Structural Design of Modular Geocellular Drainage Tanks".
- 12.2 Geocellular Storage units shall be Intesio Aquacell Core laid on 100mm thick coarse sand, wrapped in an Impermeable Geomembrane 1200g and protective Geotextile Terram 1000. Minimum laps to be 300mm. Impermeable Geo Membrane to be sealed using tape or hot weld as recommended by manufacturer. Backfill between trench walls and Aquacell units with a minimum 100mm of coarse sand or Class 6H selected granular material. Lay 100mm thick coarse sand over Geotextile and compact. Remaining excavated areas to be backfilled with DTP Type 1 Granular material in accordance with SHW Vol 1 Clause 803 under trafficked areas or selected as dug material under soft landscaped areas. Geocellular units to be installed in accordance with manufacturer's recommendations.
- 12.3 Inspection tunnels through the Geocellular structure must be provided by utilising the Aquacell plus modular units.
- 12.4 Alternative Geocellular storage units may be acceptable subject to review by the project manager.

**NOTES:**

1. This drawing is to be read in conjunction with all other relevant subcontractor's details, in addition to all relevant architect's and m&e engineer's drawings and specifications.
2. This drawing is not to be scaled. All work must be based on figured dimensions only. All dimensions are in millimetres, unless noted otherwise. All levels are in metres, unless noted otherwise.the contractor is to verify all dimensions on site prior to starting works.
3. All building materials, components and workmanship to comply with the appropriate public health acts, building regulations, british standards and codes of practice and the appropriate manufacturer's recommendations.
4. For all specialist work see relevant drawings.
5. Any discrepancies, errors or omissions to be reported to the project co-ordinator for further instructions before commencement of works.

REV	DESCRIPTION	DATE	INIT	CHKD

 calfordseaden

Client  
Rydon  
Project  
Ashton Court, Camden Park Road, Camden NW1 9HE  
Title  
Drainage Specification

Scale	Date	Drawn By	Checked By	Project No:	Drawing No:	Revision
NTS@A1	01/02/17	GRC	CJM	K160428	C(0)1000	-

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PRELIMINARY