

1.0 General

- 1.1 Drawings shall be referred to for Structural & Civil engineering work only unless otherwise stated and read in conjunction with the main Structural and Civil Specification and Architect's, Service Engineer's and Subcontractor's drawings and any other relevant contract documentation.
- 1.2 Materials and workmanship shall not be inferior to the requirements of the relevant British Standard, the NHBC, Building Regulations and/or other relevant documentation referred to in the specification and as indicated in BS8000: 'Workmanship on Building Sites'. All materials shall be CE marked where appropriate.
- 1.3 Construction tolerances to be in accordance with BS5606: 'Guide to accuracy in building' or the NSCS (cl. 4.1) or the NSSS (cl. 6.1) whichever is more onerous unless noted otherwise on the drawings.
- 1.4 Reference made to any British Standard, Specification, Code of Practice or other document shall be taken to refer to the current edition unless another edition is specifically referred too. All Eurocodes are to be read in conjunction with the relevant UK National Annex.
- 1.5 The Contractor shall check all levels and dimensions, any errors or omissions are to be reported at once to the Engineer.
- 1.6 The Contractor is to take all necessary site measurements prior to undertaking any offsite fabrication/preformed and proprietary elements.
- 1.7 All work undertaken prior to receiving Building Control, NHBC, Highway Authority, Water Authority, Lead Local Flood Authority, Environment Agency, Network Rail approval is at the Contractors risk.

2.0Setting Out, Dimensions & Levels

- 2.1 Any indication of site boundaries is to be considered diagrammatic. The Engineering Layout/External Works/Drainage Layout are based upon layouts prepared by others and our details are not in themselves intended to be any definition of land ownership.
- 2.2 Underlying topographic survey information has been provided by P Stubbington Land Surveys LTD, issued March 2018. Tullys cannot be held responsible for any inaccuracies therein.
- 2.3 All dimensions are in metres unless otherwise stated. All levels are in metres above ordnance datum.
- 2.4 Use only figures dimensions. Do not scale.
- 2.5 Levels at the site boundary are to match existing levels unless noted otherwise.
- 2.6 External levels at thresholds allow for a 15mm drop from finished floor level. The area immediately outside each front access is to slope away from the building at between 1:40 and 1:60 for a minimum distance of 1500mm.

3.0Ground Conditions

- 3.1 All information regarding below ground obstructions has been added to our general arrangement drawing as far as we are reasonably able to obtain at the time. The contractor shall allow for breaking out obstructions where necessary and increasing the depth of foundations to a suitable and approved formation, in accordance with our details.
- 3.2 The Contractor shall familiarise themselves with the contents of the Geo-Environmental Services Limited Ground Appraisal Report GE19071-GAR-JUN21.
- 3.3 In accordance with NHBC Technical Standards appropriate action should be taken to suitably restore the drainage characteristics of the soil once construction activities around the building have ended. Garden areas shall be free from obstructions beneath the surface and should be adequately prepared for cultivation. For detailed specification refer to landscape specialist details.

4.0References to Other Consultants

- 4.1 The Contractor shall liaise with the M&E (Services) Consultant/Engineer regarding the need for diversion, maintenance and protection of existing services as required in order to carry-out the works described on the Engineering Layout/External Works Layout/Drainage Layout.
- 4.2 For construction details of soft landscaping and boundary fences refer to the Landscape Architect's drawings.
- 4.3 See Landscape Architect's Hard Landscape plan and materials palette for details of surface materials.

5.0Highways

- 5.1 White-lining and signage to be in accordance with the 'Traffic Signs Regulations and General Guidance'.
- 5.2 Works within the public highway will be carried out under agreement with and as inspected by West Sussex County Council.

6.0Proprietary Products

- 6.1 Proprietary products shown on drawings shall be installed and maintained thereafter for the lifetime of the development in accordance with the manufacturer's specification.

7.0 Concrete

- 7.1 The strength criteria for the specified standard mixes (ST4 etc) shall comply with the DfT Specification for Highway Works – Table 10/1. Concrete mixes should meet the most onerous design criteria between strength and resistance to chemical attack.
- 7.2 All concrete used in below ground works shall comply with BRE Special Digest SD1 for the following aggressive conditions in the ground:
- Design sulphate class DS–1
 - Aggressive chemical environment class AC–1s
 - Design concrete class DC–1

8.0 Adoptable Drainage Standards

- 8.1 All highway drainage (road gullies, their connections and drain runs serving highway drainage only) to be constructed in accordance with West Sussex County Council design guide and specification.
- 8.2 The proposed connections into the adopted sewer network will all be subject to approval and inspection by Advanced Water Infrastructure Network (AWIN) under the terms of a Section 106 Agreement.
- 8.3 All adoptable elements of the works to be constructed in accordance with the Sewerage Sector Guidance Appendix C – Design and Construction Guidance 'the code'. Sections of the foul and surface water drainage as shown will be adopted under the terms of a Section 104 Agreement.
- 8.4 In general, all adoptable pipework to be constructed from vitrified clay to BS EN 295 or concrete to BS EN 1916 and BS 5911. Manufacturer, material and pipe diameter to be as AWIN's Pre-Approved for Use' materials list February 2025 unless agreed otherwise with AWIN.
- 8.5 Use of plastic pipework on the adoptable network is to be agreed with AWIN. The specification below is provided by AWIN:
- Manufacturer, material and pipe diameter to be as AWIN's Pre-Approved for Use' materials list February 2025 unless agreed otherwise with AWIN.
 - PVC pipes, joints and fittings fro gravity sewers and drains shall comply with the relevant provisions of BS EN 13598–1, BS 4660 or BS EN 1401–1.
 - Plastic pipes to be capable of withstanding a maximum jetting pressure of 2600 psi.
 - Thermoplastic structured wall pipes shall comply with the relevant provisions of BS EN 13476–1 and WIS 4–35–01 and BS EN 13476–2 or BS EN 13476–3 with the following properties:
 - Maximum length of pipe for laying to be 3m.
 - Pipe Nominal Short Term Ring stiffness to be not less than 8 kN/m².
 - Long term deformation to be less than 6% of the vertical nominal pipe diameter.
 - Factor of safety against buckling to be not less than 2.5.
 - Solvent cements for jointing unplasticised PVC pipes shall comply with BS EN 14814. For pipes and fittings complying with BS 4660, BS EN 13598–1 or BS EN 1401–1, solvent cement may alternatively comply with BS EN 14680.
- 8.6 Plastic inspection chambers are to be Wavin Range 450 or Range 600 and subject to approval by AWIN. 'Standard' or 'Universal' plastic inspection chambers are not acceptable for use on the adoptable drainage network.
- 8.7 Pressurised sewers will be ductile iron, MDPF, HDPE or HPPE and will be subject to approval by AWIN.
- 8.8 Depending on pipe size; pipe bed and surround must be either 10mm, 14mm or 20mm nominal single size aggregate or 14mm to 5mm or 20mm–5mm gap graded aggregate in accordance with WIS 4–08–02. The bedding must be either new imported material, or clean recycled aggregate(free of dust, brick and asbestos) complying with BS EN 1610 or BS EN 13242. Please note local authorities may have differing standards for bedding materials used in adoptable public highways.
- 8.9 Refer to AWIN's 'Pre Approved for use' materials list for acceptable manhole construction manufacturers & types. The following specifications apply.
- S Manhole covers should be Ductile Iron, Kitemarked and certified to one of the following strength standards: F900, E600, D400, C250, B125, A15. Covers should be sized in line with the Design & Construction Guidance. For assets outside the scope of the DCS, specification should be agreed with the Design Technician. Manhole covers should be stamped with a mark designating it as a foul water (FW) or surface water (SW) cover.
 - Step Rungs should be double width, plastic encapsulated mild steel.
 - Ladders should comply with the requirements of BS EN 14396 and any other applicable standards as mentioned in the Design & Construction Guidance for specific materials. For further information please see E2.37 in the Design and Construction Guidance. Ladders must be installed as per manufacturers guidance using the appropriate brackets for the chamber type/material and internal wall profile.
 - All bricks must be Class B or Class A solid engineering bricks. Brickwork must be laid using English bond and be a minimum of 215mm thick.
- 8.10 For concrete to adoptable drainage the following apply:
- All poured concrete must GEN3 or higher.
 - Structurally designed reinforcement must be installed as per the approved drawings. Any amendment must be approved by the developers' structural engineers.
 - Structural steel mesh must be class A393 under BS 4483 and BS EN 10080, unless otherwise approved. Mesh can be bent or cut as required.

Private Drainage Standards

- 9.1 Pipes and channels constructed within private drainage to be either:
- Concrete to BS EN 1916 & BS 5911
 - Extra Strength Vitrified Clay to BS EN 295
 - Unplasticised PVC to BS EN 1401 (Not to be used in adoptable drainage)
- 9.2 Construction to comply with NHBC requirements and BS EN 752.
- 9.3 Drainage from units to be in plastic pipe–work to BS EN 1452 & BS EN 13598
- 9.4 Manhole covers and frames are to be in accordance with BS EN 124 and kite–marked.
- 9.5 Pipe runs between numbered manholes/inspection chambers to be below ground quality iron where passing beneath structures. Plastic pipes can be used if provided with concrete bed and surround and pressure tested prior to casting the slab above.

10.0 Pipe Sizes & Gradients

- 10.1 All pipes are to be 100mm diameter unless otherwise shown except for highway and road gully connections which are to be 150 mm diameter.
- 10.2 All pipes connected to a chamber shall have a common soffit level unless otherwise stated.
- 10.3 Positions shown for gullies are to be adjusted on site if necessary to suit as–built low points and in agreement with the adopting authority.
- 10.4 Foul drainage pipe runs upstream of the referenced manhole network referred to in the manhole schedules shall be laid to a minimum gradient of 1:40.
- 10.5 Surface water drainage pipe runs upstream of the referenced manhole network referred to in the manhole schedules shall be laid to a minimum gradient of 1:80.
- 10.6 Depth to pipe invert at rodding eyes to be 600mm unless otherwise stated.
- 10.7 Where two pipes cross each other beneath a trafficked area with a separation of less than 150mm both pipes shall have Class 'A' concrete surround 500mm either side of crossing point.

11.0 Rest Bends & Drainage Beneath Structures

- 11.1 All foul and surface water rest bends to have a minimum radius of 200mm about their central axis. Rest–bend invert levels shall be as defined on the drainage layouts
- 11.2 Drainage beneath the floor slab shall be bedded within compacted acceptable earthworks material as defined in the DfT Specification for Highway Works. Where the cover to the drainage pipe is less than 300mm beneath the upper surface of the natural ground or compacted material a Class A bed & surround is required. Where cover to the top of pipe is greater than 300mm a Class S bed and surround is to be used.
- 11.3 Where not encased within the concrete foundations or Class A bed & surround, rest bends shall be provided with a ST2 150mm bed and haunch support irrespective of depth beneath the floor slab.
- 11.4 Where drainage passes under walls lintels to be used to bridge wall over pipe.
- 11.5 Connections into pipe runs beneath buildings will not be permitted with the exception of wash hand basins, baths or showers strictly in accordance with NHBC Technical Guidance 'Y Junctions in Drains Under Buildings'.

12.0 Below Ground Drainage Tanks

Not used.

13.0 Manholes & Gullies

- 13.1 Cover levels of manholes and inspection chambers are for information only and must not be used for setting out purposes. Covers are to be set flush with the final carriageway, footway or ground level. Covers of existing manholes and service chambers that are to be retained shall be adjusted to match proposed levels.
- 13.2 Existing manhole invert levels within the existing local drainage network are based on design intent drawings by Patrick Parsons and various sources of asbuilt surveys and design intent drawings. This information has been used for design purposes. However invert levels of existing manholes and sewers into which connections are to be made shall be checked again and any discrepancies confirmed to the Engineer at least five working days prior to the commencement of any drainage construction works.
- 13.3 Where new manholes are to be constructed on the existing sewer network proposed invert levels have been determined by interpolation of the above information between the relevant existing manholes. The actual invert level shall be determined on site and any discrepancies confirmed to the Engineer at least five working days prior to the commencement of any drainage construction works.
- 13.4 Where a manhole is located in or close to the centre of a carriageway the cover slab shall be orientated such that the access point is as far as possible from the carriageway centre–line.
- 13.5 Where a manhole is located in a hard–paved area the cover shall be orientated where possible such that it lies square with the surrounding pavers.
- 13.6 In block paved areas recessed tray covers may be required. Refer to Landscape Architect's layout/Employers Requirements. Recessed tray covers are not permitted for use in adoptable drainage.
- 13.7 Where possible manhole covers shall be located such that they do not cross a boundary between hard and soft landscaping.
- 13.9 Manhole covers to be at least 0.5m from kerblines and, where reasonably possible to do so, outside the wheeltracks of typical vehicles.
- 13.10 Manhole cover grades to be as below unless otherwise stated in the Manhole Schedules:
- Carriageway – D400
 - Footway used for refuse vehicle access – D400
 - Footway – B125
 - Communal footpaths, hard landscaping and soft landscaping where possible vehicular access for maintenance – B125
 - Private patios, gardens and soft landscaping where no vehicular access for maintenance – A15
- 13.11 It is important that the water level in the traps within internal floor gullies and any reverse interceptors is regularly checked and maintained in order to prevent the escape of noxious gases from the sewer network.

14.0 Abandonment, Protection of Drains, Final Testing & Maintenance

- 14.1 Existing drains to be abandoned shall be grubbed out or filled with grout or foam concrete in accordance with Clauses 201 & 506 of the DfT Specification for Highway Works. Manholes to be broken–out down to proposed formation level and backfilled. Beneath trafficked areas back–fill to formation level with compacted capping material.
- 14.2 The contractor shall take the necessary measures required to avoid damage to the existing drains and services that are to be retained and those installed as part of the works.
- 14.3 The existing drain runs identified are to be CCTV surveyed and the report submitted to the Engineer at least 5–working days prior to the commencement of any drainage works.
- 14.4 All newly constructed drainage is to be jetted to remove any debris and CCTV surveyed. A copy of the CCTV survey is to be submitted to the relevant approving authority prior to hand–over of the works. Pressure testing to be carried out to the following requirements;
- Adoptable drainage – SSG Code.
 - Private drainage – Building Regulations Approved Document H Sections 1.38 & 2.59–2.62, NHBC Standards Section 5.3.17, BS 8000 Part 13, BS EN 752 and BS EN 12056.
- 14.5 Sewer jetting for future maintenance should accord with BS EN 14654–1:2014 and the 'Sewer Jetting Code of Practice' (published by WRc). Manufacturers of the drainage system components should also be consulted but under no circumstances should the following pressures be exceeded;
- | | |
|----------------|------------|
| Brick sewers | – 1500 psi |
| Plastic pipes | – 2600 psi |
| Clay pipes | – 5000 psi |
| Concrete pipes | – 5000 psi |

15.0 Miscellaneous

- 15.1 Unless stated otherwise via gradients and/or invert levels and/or coordinates on the drainage layout, drainage spurs as provided for future connections shall be constructed at a gradient of 1 in 60 rising away from the chamber to which they are connected and shall be terminated 1.0m beyond the outer edge of the concrete surround to the chamber. Each spur shall be provided at its upper end with a proprietary water–tight stopper.
- 15.2 Where surface water is discharged to a combined sewer a non–return valve shall be incorporated on the surface water system as close to the combined sewer as possible.

General Notes:

P02	07.01.26	Notes 8.2 & 8.4 to 8.6 updated and Notes 8.7 to 8.10 added to match Advanced Water Infrastructure Networks specifications.	IU	PAJT
P01	20.08.25	First issue.	IU	PAJT
Rev	Date	Description	By	Ckd
PRELIMINARY			SUITABILITY CODE S3	
CLIENT				
DEVINE HOMES PLC builders of fine homes				
Tullys www.tullys.ukinfo@tullys.uk01342 828000				
PROJECT				
Land south of Station Road, Cowfold, RH13 8QZ				
DRAWING TITLE				
Civil Engineering General Notes				
Originator No.	Scale	Revision		
15478	N/A@A1	P02		
PROJECT - ORIGINATOR - VOLUME - LEVEL - TYPE - ROLE - NUMBER				
15478-TUL-XX-00-DR-C-91001				