

# Well Drillers Association Specifications and Standards

## Guidance notes for the construction of boreholes for water supply

These Guidance Notes indicate the contract arrangements, specifications and general matters which can be applied to the construction and installation of water supply boreholes. All work carried out must be in accordance with the latest Health and Safety legislation with responsibility for compliance on Health and Safety resting jointly with the client, consultant and the drilling contractor.

The Guidance Notes make reference to Government Regulations, BSI Standards and other documents and summarises some aspects and features contained in these documents. It is the responsibility of the client and the contractor to become more conversant with all appropriate legislation, standards and documents and not rely on any references and summaries contained in this document which are not complete or comprehensive

## Contract Arrangements

- a. At the earliest opportunity the client or the contractor should obtain a hydrogeological report for the proposed borehole location from such as the Records Section British Geological Survey (email [hydroenq@bgs.ac.uk](mailto:hydroenq@bgs.ac.uk) or tel 01491 838800). A fee will be charged for this report. The report will indicate the likely geological and groundwater conditions in the area with possible yields and drawdowns. It will also indicate the potential presence of artesian or sub-artesian water pressures which could influence the borehole construction.
- b. In England and Wales no consent to drill and test pump is required for a domestic supply (maximum 20 cubic metres per day). In Scotland application for authorisation is required for groundwater abstractions greater than 10cu m per day. Construction of boreholes intended for small scale abstraction (less than 10 cu m per day) and small abstractions from these boreholes are covered by a general binding rule (GBR). However it is strongly recommended that contact should be made with the Water Resources Manager at the local Environment Agency or Scottish Environment Protection Agency (SEPA) Office (see Yellow Pages) prior to any action on site. This will provide information to all parties and can avoid wasted efforts if the area or aquifer is unsuitable or potentially contaminated.
- c. Any contract between a client and the contractor should be in a written format and include a detailed estimate from the contractor of the work to be carried out, its cost and a written acceptance by the client or written confirmation of any acceptance by the contractor.
- d. The detailed estimate itemising the main parts of the work should refer to the expected hydrogeological conditions and clearly show the anticipated diameters and depths to be penetrated, the depths and diameters of permanent steel casings, liners and screens to be installed together with details of any backfill materials and the headwork details. It should also show details of any services

to be provided free of charge by the client and, for a pumping test, the required maximum yields and the periods of testing and recovery.

- e. The contractor cannot be responsible for the quantity and quality of any water obtained from the boreholes.
- f. Payment terms should be clearly stated in the estimate.
- g. The client's acceptance should clearly state what parts of the estimate he is accepting and any clarifications regarding anomolous issues raised by the contractor.
- h. During the currency of the contract the contractor should advise the client verbally of any change(s) to the work estimated and confirmed in writing within one week of the change(s).
- i. The contractor should submit an interim application or measure for a given period followed by an invoice for the agreed amount. The client must be aware that the period for payment runs from the date of the interim application or measure. Alternatively the contractor should submit an invoice supported by a breakdown of the work performed to date.
- j. If a formal contract is required then the Institution of Civil Engineers Conditions of Contract for use in connection with Ground Investigation First Edition (1983) are appropriate. (Alternatively the ICE Conditions of Contract for use in connection with Works of Civil Engineering Construction Sixth Edition (1991) or ICE Conditions of Contract for Minor Works Second Edition (1995) can be used.

## General

- a. Contamination can occur from surface sources such as animals, fuel and chemicals etc or from one aquifer to another when one aquifer has previously been contaminated. Liason with the local Environment Agency or SEPA office to avoid surface or cross aquifer contamination is recommended.
- b. To avoid pollution of a water supply or maintain borehole stability the upper section of the borehole should incorporate a steel or thermoplastic casing suitable for water supply and conforming to BS 879 concreted or grouted into rock or an impermeable stratum with a bolted flange plate cover on top or a concrete manhole with a lockable steel cover. Any concrete base/ surround to the manhole should have a minimum thickness of 150mm.
- c. On completion of drilling and the installation of any liner or casings the contractor should provide the client with a written statement of the strata or materials penetrated and the details of the casing and any pump installation. Copies should also be submitted to the local Environment Agency or SEPA office and to the British Geological Survey.
- d. If test pumping is carried out the results of the test should be presented in a written format by the contractor as laid down by the Environment Agency Consent or SEPA licence document. If a statutory consent/licence is not required the Environment Agency format should be followed and copies sent to the local Environment Agency office and to the British Geological Survey.

## Specifications

- a. The contract should refer to recognised national industry standards or their international equivalent namely:-  
Civil Engineering Specification for the Water Industry Fifth Edition 1998.
- b. Well Construction Specification for the Water Industry Second Edition 1985. (Supplement to Civil Engineering Specification for the Water Industry).
- c. BS 879 1985 Part 1 Steel Casings. This specifies the diameter and minimum wall thickness of steel casings to used in boreholes. All casings including temporary casings to be in good condition. (Alternatively API Specification 5L Grade B with minimum wall thickness as in BS 879).
- d. BS 3416: Type II Coating materials Clause 11. Permanent steel casings to be protected both externally and internally with suitable coating material.
- e. BS 879 Part 2 (1988). Thermoplastic Casing and Screen. This specifies the diameter and minimum wall thickness of thermoplastic liners and screens to use in boreholes. Where a geotextile wrap is

specified then the micron size, layering and method of fixing (steel banding or preferably heat sealing) should be stated.

- f. BS 12 1991 Specification for Portland Cement. When grouting below the standing water level this should be carried out by a tremmie pipe inserted to the full depth of the borehole and progressively withdrawn as any temporary casing is extracted. The minimum grout annulus should be 50mm and the grout mix specified (generally one part water to two parts ordinary Portland cement by weight). Adequate setting period for the grout to be stated (generally 24 hours if drilling is to continue in the borehole after grout is placed).
- g. BS 14686; 2003. Test pumping of Water Wells. The Environment Agency Consent or SEPA licence document details the period of test pumping and the frequency of water level reading before and after testing for relevant boreholes. Flow rates should be measured using at least one recently calibrated flowmeter.

## **Water Resources Legislation**

- a. Water Act 1945 Section 7 as amended by the Science and Technology Act 1965 (Notification of start of boring and submission of results British Geological Survey).
- b. Water Resources Act 1991. Licensing Regulations including Section 32 Consents.
- c. Water Act 2003. Restrictions on abstractions and licence applications.
- d. The Water Environment (Controlled Activities) (Scotland) Regulations 2005 amongst other things sets out a system of abstraction control for Scotland.