

**Water Supply and Wells**

Where a development will, for one reason or another, be dependent upon a source of water supply other than from the waterworks, the adequacy and probable effects of the supply should be closely investigated before any design work is started. Application to the Water Authority for the issue of a Certificate Regarding Water Supply Availability should be made at an early date and such certificate should be submitted together with the first submission of building plans.

2. Where the Water Authority certifies (on Form WWO 1004 or current equivalent) under Building (Standards of Sanitary Fitments, Plumbing, Drainage Works and Latrines) Regulation 10A(5) that a supply of water from the waterworks is not available, permission may be considered upon application to obtain water from a well or other sources.

Assessment of Demand

3. Assessments of flushing and potable water demand should be made with regard to Building (Standards of Sanitary Fitments, Plumbing, Drainage Works and Latrines) Regulation 10A(4). For clarification, 'potable water' refers to a supply of water for the purposes of Building (Standards of Sanitary Fitments, Plumbing, Drainage Works and Latrines) Regulation 10A(2).

Flushing Supply

4. The quantity of water required for flushing should be assessed in accordance with the following standards:

User	Unit	Average Demand
Domestic buildings	per number of required soil fitment per day	450 litres
Offices, factories, department stores, shops, public buildings and other non-domestic buildings of a like nature	per number of required soil fitment per day	450 litres
Restaurants	per seat per day	13.5 litres
Cinemas	per seat per day	4.5 litres
Schools	per head per day	18 litres
Hotels and boarding houses	per room per day	90 litres

Potable Supply

5. In view of the diversity and degree of fluctuation in demand, potable supply should be assessed on individual merits and should be satisfactory and sufficient in all respects for the purposes for which potable water is supplied. Where in doubt, the Water Authority may be consulted.

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For Air-conditioning

6. The Water Authority has advised that neither a fresh nor a salt mains water supply will be provided for evaporative type air-conditioning, except where required in connection with a specific industrial process, and then only for the immediate needs of that process.

Wells

7. Normally, wells may not be sunk on government land. Permission under Building (Construction) Regulation 175 to sink a well in private land will only be given where:

- (a) the well yield is adequate, and
- (b) the water abstraction will not adversely affect nearby services, buildings, structures or land.

8. An application for permission to sink a well should be accompanied by the following:

- (a) A plan, including cross-sections, showing the proposed well relative to any services, buildings, structures and land which are within the area of groundwater drawdown likely to be caused by the water extraction, existing ground conditions in the area, and any changes to such conditions which will result from the development for which this well is required.
- (b) A plan showing details of the well design, including well screen and electrode switching devices, if any, and a statement of the proposed well development method.
- (c) A statement of the proposed rate and duration per day of water extraction.
- (d) A proposal for carrying out a well yield test.

9. If the above cannot demonstrate that the nearby services, buildings, structures or land will not be affected, the following additional particulars may be required:

- (a) A site investigation report specific to the proposed well construction, with drillhole logs embracing the site area, including measurements of groundwater/piezometric levels and field permeability tests.
- (b) A geotechnical assessment, supported by calculations, of the effect of the proposed water extraction, in both the short and long term, on affected services, buildings, structures or land. The assessment should include groundwater changes, ground movements, and stability of adjacent buildings, structures and land as appropriate.
- (c) If necessary, a detailed proposal for conducting field tests either separately or in conjunction with the yield test, to verify assumptions and predictions made in (b) above.

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10. There are certain areas in the Territory where, because of the geological conditions, it is not advisable to sink wells to extract groundwater as this is likely to cause excessive settlement. The Water Authority has agreed that flushing water will normally be supplied whenever possible within these areas, which at present include Yuen Long Town.

Well Yield Test

11. Where, the period of pumping is to be less than 12 hours per day, the manner and method of testing described in Appendix A is approved for the purposes of Building (Construction) Regulation 177(2) and (3). Where the required quantity of water cannot be obtained with less than 12 hours pumping per day or where there is concern over the long term yield of a well, a more sophisticated test may be required. For such cases, subject to approval, other methods as recommended in BS 6316:1983 may be used alternatively.

12. Both the Buildings Ordinance Office and the Geotechnical Control Office should be notified in writing at least one week before the commencement of any well yield test.

Certificates as to Supply of Water

13. The Certificates required by Building (Administration) Regulation 25A to be made by authorized persons will be accepted in the model forms suggested at Appendix B (for permanent connection) and Appendix C (in accordance with Building (Construction) Regulation 177(4)). One extra copy of reports on well yield tests should be submitted for the Geotechnical Information Unit of the Civil Engineering Library via the Geotechnical Control Office.

14. The water quality of potable water supplies should also be to the satisfaction of the Building Authority and in this respect submission of a water sample examination report (obtainable from the Water Authority on application), or other acceptable evidence, may be required.



(A.G. Eason)
Building Authority

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Index under : B(A)R 25A - Water Supply Certificate
B(SSFPDW&L)R - Water Supply
Flushing Water Demand, Assessment of
Water Supply, from Well or Other Sources
Well Yield Test

Well Yield Test Procedure

1. A yield test on a well shall only be carried out during the period from 1 December to 30 April .
2. The well yield test shall be carried out over a period of seven consecutive days. The rate of pumping for the first to the sixth day shall be the proposed daily yield averaged over the proposed daily pumping period for the well, which shall not be more than 12 hours per day, to permit at least a 12 hour daily recovery period. (See paragraph 5 for the pumping rate on the seventh day).
3. The actual quantity of water pumped each day shall be measured by a water meter. The quantity pumped shall not be calculated from the rated output of the pump.
4. The water level in the pumping well, measured from the ground surface, shall be read at least 24 hours before the start of the test, immediately prior to the start, and immediately before the finish of each day's pumping. For the first and the sixth day of pumping, the water level shall **also** be measured, with respect to time since pumping commenced, at 1 minute intervals for the first 10 minutes and every 10 minutes from 10 to 120 minutes, and every 1½ hours thereafter for the duration of pumping.
5. An examination for suspended soil particles in the pumped water shall be made on the seventh day, at the full discharge rate of the installed pump and at the maximum drawdown level.
6. The water pumped from the well shall be discharged into a proper drain or water course and not into any position where it can percolate back into the well or the aquifer.

Notes

- (a) This test is used only to ascertain that the quantity of water required is available, to test the recharge and recovery of groundwater, and to test the adequacy of the well screen and filter pack to prevent excessive soil loss.
 - (b) The duration of pumping per day should be long enough to provide the required daily well yield. Under no circumstances should it be assumed that, because the required flow can be met for part of a 24 hour period, it can continue to be met for a 24 hour day for 7 days per week.
 - (c) The test results are acceptable if the quantity of water pumped each day is not less than the required daily quantity and there is adequate recovery of groundwater after the pumping is stopped each day, and the pumped water is clean when examined as in paragraph 5 above.
 - (d) Well yield test results should be recorded in the form as Annex I.
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RECORDS OF WELL YIELD TEST

1. Quantity of flushing/potable* water required per day = litres.
2. Depth of well = m. (Depth to : top of screen = m.)
 bottom of screen = m.)
3. Diameter of well = mm.
4. Type of pump : surface/submersible* (Make/Model No.).
5. Groundwater level at 24 hours before test = m. (taken on).
6. For test carried out in accordance with the procedure described in Appendix A to PNAP:17.

Date	Time		Hours pumped	Quantity of water abstracted (litres)	Water level in well(s)	
	Start	Stop			Before Pumping	After Pumping

7. For tests carried out on the first and sixth days of pumping in accordance with the procedure described in Appendix A of PNAP:17.

Date	Time	Time since pumping commenced (min.)	Groundwater level (m.)	Drawdown (m.)

Notes : The drawdown data versus log time in minutes should be plotted on semilog graph paper. When this plot forms a straight line, the test data can be analysed by Jacob's Method for non-equilibrium conditions. For plots showing a non-linear relationship between drawdown and log time data, another appropriate method to analyse the time-drawdown data should be used e.g. see those given in Todd, D.K. (1980) **Groundwater Hydrology**, Second Edition, John Wiley & Sons, New York.

* Delete as appropriate.

(Model Certificate)

Certificate by an Authorized Person
Regarding Connection of Water Supply

Building (Administration) Regulations

Regulation 25A (state paragraph and sub-paragraph)*

To : The Building Authority

BOO Ref. : _____

Date : _____

Address : _____

Lot No. : _____

Connection of (Flushing/
Potable)* Water Supply from a (Well/Source other than
well or waterworks)*

I hereby certify that a permanent connection to the above building of a supply of water from (a well/other source (state source))* has been made in accordance with Regulation 10A (state relevant paragraph and sub-paragraph)* of the Building (Standards of Sanitary Fitments, Plumbing, Drainage Works and Latrines) Regulations.

Signed _____
Authorized Person

* State as appropriate.

(Model Certificate)

Well Yield Test Certificate

Building (Construction) Regulation 177(4)

To : The Building Authority

BOO Ref. : _____

Date : _____

Address : _____

Lot No. : _____

I hereby certify that a Well Yield Test has been carried out in accordance with the approved well plan and the standard procedure described in Appendix A of Practice Note for Authorized Persons and Registered Structural Engineers No. 17 (or state other approved alternative method)* and that the results shown in Annex I attached are a true record.

Signed _____
Authorized Person

* State as appropriate.
