

THE INSTITUTE OF WOOD PRESERVING AND DAMP-PROOFING

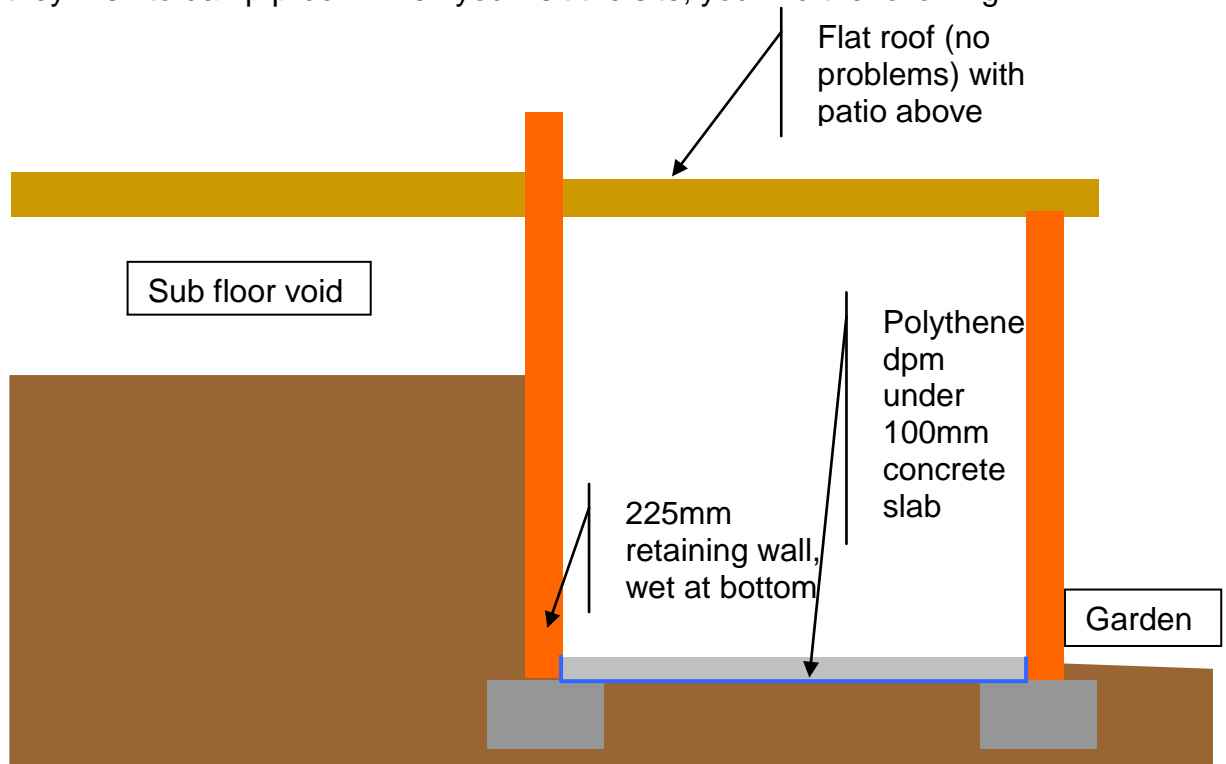
**Certificated Surveyor in Structural Waterproofing Examination (CSSW)
14th November 2007**

NOTES FOR CANDIDATES:

1. Read the instructions and questions carefully
 2. Answers should be illustrated with sketches where appropriate
 3. Any abbreviations must be given in full when first used
 4. The duration of this written paper is 2½ hours
 5. **All 8** questions should be answered
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PART 1:

1. You are invited to inspect the home of a potential client who has a cellar which they wish to damp proof. When you visit the site, you find the following:



On further investigation, you observe the following:

- i. The base of the earth retaining wall is very damp, and there is some evidence of silting around the base of the wall on the concrete.
- ii. Above the base of the wall, the dampness reduces until about 300mm above the ground forming the sub floor void, from where it is dry.
- iii. There is no dampness on the opposite wall between the cellar and the garden.

The client advises that he wants to convert the cellar into a utility room, and that there is no need for complete “tanking”. Furthermore, cost is of the essence, and he is prepared to accept a partial system.

Prepare:

- i. An outline specification for a partial system that would meet the client’s requirements, giving reasons for your choices.
- ii. A letter to the client advising him of what the risks of this partial system are, in such a way that you would be covered if dampness ever appeared in other areas.

[20 marks]

2. You have been asked to visit a new property where the basement has been waterproofed by the builder. We know that the waterproofing has failed because, every time it rains for more than a few hours, 30 – 40mm of water floods the floor. The customer had drawings and details of the way the property was constructed, which he gave to you for your information. During your examination of these drawings and details and your visual inspection of the basement, you made the following observations:

- i. The basement walls are constructed from two skins of concrete block, sandwiching a layer of reinforced concrete. These walls were built off a reinforced concrete raft.
- ii. The basement was built approximately 2m into the earth.
- iii. The waterproofing consisted of a layer of bonded sheet membrane underneath the floor slab and taken up the outside of the walls, with protection board against the membrane on the walls.
- iv. No drainage was provided either externally or internally.
- v. The soil survey said the soil was largely sand and well drained, although there were bands of clay starting approximately 1.5m below ground, and there was some seepage of water from those clay bands.

- vi. The basement was backfilled with the same soil that was removed during excavation.
- vii. The basement was to be used for habitable accommodation, including a kitchen, children's play room, and bedrooms.

Suggest reasons as to why the waterproofing has failed, and comment on whether or not the design complies with BS 8102. If not, why not, and how could the design have been modified at design stage so that it would comply?

[20 marks]

PART 2:

3. An architect has asked you to advise him on a waterproofing design. He has proposed using a bonded sheet membrane under the floor and up the outside of the walls. The site is clay and he does not want to use a land drain, saying that manufacturer has told him that, properly installed, the membrane is waterproof.

Write a brief letter to the architect criticising his design, and using references to BS 8102 to convince him that a land drain should be used.

[15 marks]

4. It is not possible to design or produce the perfect system. Discuss the design principles you would use when deciding on a waterproofing system for an existing underground basement that is to be used:
- i. For a car park.
 - ii. For habitable accommodation.
 - iii. For a paper archives.

[15 marks]

5. Following the application of a cementitious system condensation may occur:
- i. Define 'Relative humidity' and 'Dew point'
 - ii. What part do 'relative humidity' and 'dew point' play in the formation of
 - a. surface condensation
 - b. interstitial condensation
 - iii. What instruments/methods would you use to determine that surface condensation was the cause of dampness following the installation of a cementitious system, and not a water-proofing failure.

[15 marks]

PART 3:

6. Explain the difference between a 'risk' and a 'hazard' as defined by the Health and Safety Executive, and give a simple example to illustrate that you understand the difference.

[5 marks]

7. Where preparation works are carried out prior to the application of a cementitious water-proofing system being installed in a basement room with little natural ventilation, what problems may arise?

[5 marks]

8. List the titles of at least three sources of information, for example Codes of Practice, relating to surveying, reporting and conducting structural waterproofing work

[5 marks]