

THE INSTITUTE OF WOOD PRESERVING AND DAMP-PROOFING

**Certificated Surveyor in Structural Waterproofing Examination (CSSW)
28th June 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 have been asked to prepare a specification for the waterproofing of a basement in a private home. During the course of the survey, you established the following:
 - i. The basement is part of a complex next to the River Thames, and is to be used for office accommodation.
 - ii. The outside soil is Thames Gravel, and is exceedingly permeable.
 - iii. At every high tide there is approximately 450mm of water in the basement – more during spring tides.
 - iv. The walls are 225mm brickwork, and the floor is a screed on an unknown substrate.

What system would you consider to be most appropriate, and why?

Prepare an outline specification for the installation of this system.

[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. With the aid of diagrams, discuss what happens to the following structural elements when they are loaded as follows:
- i. A mass concrete floor slab with a cementitious render applied internally, when the water table rises.
 - ii. A structurally reinforced concrete floor slab with a cementitious render applied internally, when the water table rises.
 - iii. A wall with a cementitious render applied internally, when the water table rises.
 - iv. A floor slab with a cavity drain membrane leading to a sump and pump.
[15 marks]
5. Following the application of a cementitious system surface condensation may occur:
- i. Define 'Relative humidity' and 'Dew point'
 - ii. What part do 'relative humidity' and 'dew point' play in the formation of surface 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. What are the legal implications of your survey report for which-
- (a) You receive payment,
 - (b) It is a 'free' survey?
[5 marks]
7. List the hazards and the personal protective equipment appropriate at each stage of the application of a cementitious water-proofing system.
[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]