

**UNIVERSITY OF BOLTON**

**SCHOOL OF THE BUILT ENVIRONMENT &  
ENGINEERING**

**BSc (HONS) ARCHITECTURAL TECHNOLOGY**

**BSc (HONS) BUILDING SURVEYING AND  
PROPERTY MANAGEMENT**

**BSc (HONS) CONSTRUCTION MANAGEMENT**

**BSc (HONS) QUANTITY SURVEYING AND  
COMMERCIAL MANAGEMENT**

**SEMESTER ONE EXAMINATION 2009/2010**

**BUILDING AND ENVIRONMENTAL TECHNOLOGY**

**MODULE NO: BLT2002**

Date: Tuesday 19 January 2010

Time: 2.00 pm – 5.00 pm

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**INSTRUCTIONS TO CANDIDATES:**

There are SIX questions.

Answer ANY FIVE questions from Sections A and B.

All questions carry equal marks.

Marks for parts of questions are shown in brackets.

Use one answer book for questions from Section A and one answer book for questions from Section B.

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**Section A**

**Questions 1,2,3 in section A only relate to the development of a proposed six storey apartment block**

1. It is proposed to construct a six storey apartment block with car park below on the site of a former bus depot. The existing building is a former bus depot approximate height including roof is 12m. The construction consists of a pitched slate roof supported on steel trusses and timber rafters. The wall is constructed of local stone with cavity and clay common bricks. The floor is solid concrete slab. The intention is that the stone facade will be retained on two sides of the building due to a Local Authority planning condition. The site is confined by a road that surrounds the site making it quite confined.
- (a) Discuss a suitable method of demolition of the existing bus depot that takes into account the site location and health and safety issues associated with the demolition process.  
(10 marks)
- (b) Using figure 1 attached explain with the aid of annotated sketch how the existing façade can be given temporary support during the construction of the six storey apartment block.  
(5 marks)
- (c) Briefly explain your choice of temporary support in relation to the site location and access to the works.  
(5 marks)

**Total 20 marks**

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2. The original design of the apartment block was to be that of an in-situ reinforced concrete frame building. The client has requested that you review the proposed construction method and compare it to using a steel frame building.

(a) Discuss the advantages and disadvantages of using in-situ reinforced concrete compared to steel frame and advise the client accordingly.

(10 marks)

(b) Explain with the aid of neat annotated diagrams the sequence of casting a reinforced in-situ column.

(5 marks)

(c) Explain with the aid of a neat annotated diagram how a steel column is secured to a pad foundation.

(5 marks)

**Total 20 marks**

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3. The apartment block is to be completed with a flat roof construction and clad with a suitable cladding system which will complement the historic environment.

(a) Discuss three options that could be used for the construction of the flat roof considering the advantages and disadvantages of each method.

(10 marks)

(b) Produce a neat annotated section diagram through one of the flat roof methods described above.

(5 marks)

(c) Explain with the aid of diagrams a suitable cladding system that could be used on the apartment block.

(5 marks)

**Total 20 marks**

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**Section B – Environmental Technology**

4.

- a) With the aid of a block diagram explain how a source of raw water is treated to a suitable standard for distribution to property. Within your answer make reference to the water standards that are to be achieved by the treatment process.

(10 marks)

- b) With the aid of annotated diagrams explain the principles of operation of both the direct and indirect methods of distributing cold water within a domestic property. Compare and contrast the relative advantages and disadvantages of both systems.

(10 marks)

**(Total 20 marks)**

5.

- a) Explain the need for connecting sanitary appliances to trapped outlets. Within your answer give two common examples of types of trap and explain what is meant by the depth of seal.

(8 marks)

- b) State and explain three causes for the loss of trap water seal on sanitary appliances. Describe three solution methods that may be adopted to resolve the problem. Use diagrams to illustrate your answer.

(6 marks)

- c) Describe the standard air test procedure for sanitary pipe work.

(6 marks)

**(Total 20 marks)**

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6.

- a) With the aid of diagrams describe the layout and explain the operation of a typical modern two pipe domestic heating system. Comment on the relative merits of this system over others.

(6 marks)

- b) Explain the basic operation of three of the heating controls listed below.

- I. Motorised valve.
- II. Programmer.
- III. Room Thermostat.
- IV. Cylinder thermostat.

(8 marks)

- c) Describe the operation of a thermostatic radiator valve. Within your answer discuss the precautions necessary when installing this type of valve in relation to the provision of boiler interlock.

(6 marks)

**(Total 20 marks)**

**END OF QUESTIONS**

EXISTING FACADE

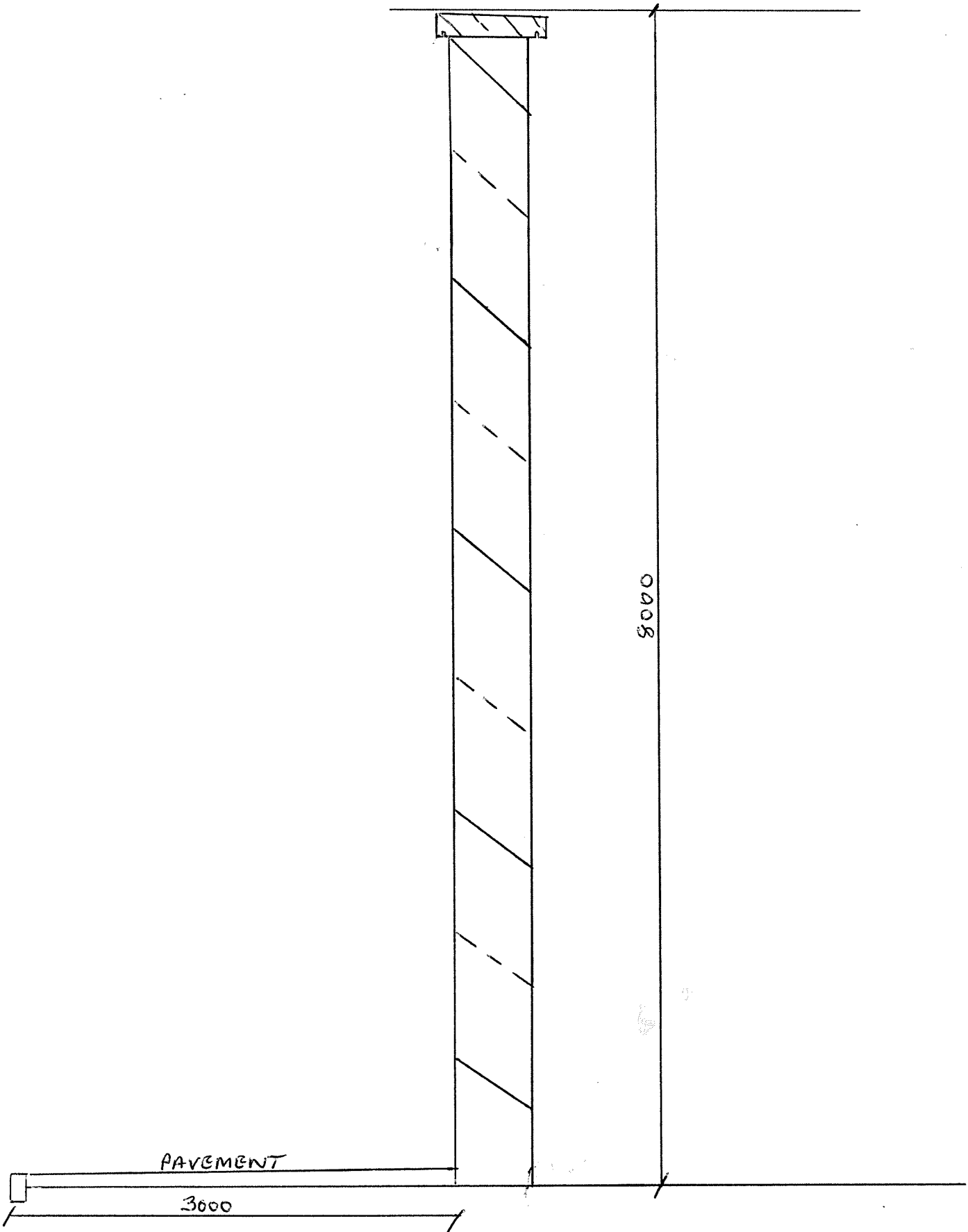


FIGURE 1