BCCP – Sample Questions from 2004 Exam

(Answers on Page 10)

Section A

MA20. The British Columbia Building Code 1998 Part 4 is applicable to:

A. Assembly Occupancies with Building Area less than 600 square metres.
B. Residential Occupancies with Building Area more than 600 square metres.
C. Neither a) nor b) above.
D. Both a) and b) above.

Section B

MB14. In accordance with BCBC 1998 Part 4, the full uniform design load due to snow and rain for a typical peaked roof with a 4:12 pitched roof constructed in Cranbrook, BC in an area with normal exposure to wind is:

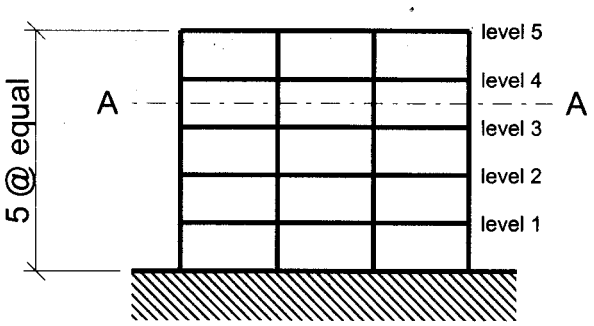
A. 1.62kPa.
B. 2.36kPa.
C. 2.90kPa.
D. 3.58kPa.

MB28. In accordance with BCBC 1998 Part 4, the mass used for calculation of seismic loads shall not include:

A. The full unfactored mass of the structure attributable to selfweight of the structure.
B. The full unfactored mass of permanent fixtures including partitions.
C. The full unfactored mass of snow loads.
D. The full unfactored mass of tank contents.

Section C

MC37.



A five-storey building has the following characteristics: uniform interstorey heights h_s and storey weights W_x; fundamental period T = 0.5 second; design lateral seismic force at the base of the structure V = 900 kN (200 kips). What is the total interstorey shear on the horizontal plane A-A that lies between levels 3 and 4, as shown in Diagram C-2?

A. 180 kN (40 kips).
B. 240 kN (53 kips).
C. 540 kN (120 kips).
D. 720 kN (160 kips).

MC47. A three-story elementary school building having a computed seismic weight W of 6000kN (1345 kips) is located in Richmond (Za=Zv=4, v=0.2). It has a period of 0.33sec. The foundation condition is described as soft soil with a foundation factor F of 2.0. In the direction of concern there are a mixture of nominally ductile concentrically braced frames and nominal ductile steel moment frames. What is the factored seismic base shear on the building in this direction?

A. V=936 kN (210 kips).
B. V=1080 kN (243 kips).
C. V=1404 kN (315 kips).
D. V=1953 kN (439 kips).

Section D

MD12. A one storey steel moment frame is 6m (20 ft) tall and 9m (30 ft) wide. The columns are of equal length and cross section and are assumed pinned at the base. The beam is very stiff compared to the columns. A roof weight of 100 kN (22.5 kips) is tributary to the frame. If the moment of inertia of the columns is $20x10^6$ mm^4 (48 in^4) what is the period of the frame?

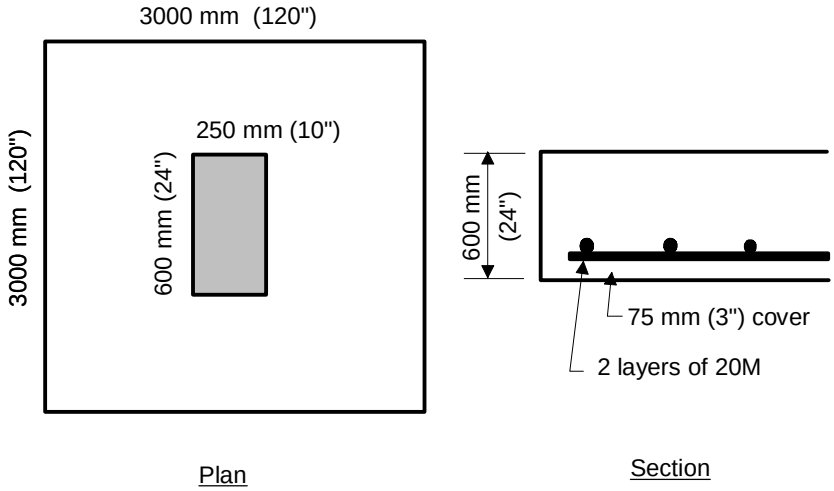
A. 1.9 sec
B. 2.7 sec
C. 6.0 sec.
D. .0 sec

Section E

ME52. A 350 mm x 350 mm (14" x 14") column has 4-25M longitudinal bars at d = 280 mm (11.0"). It carries a factored shear of 100 kN (22.5 kips). What is the maximum spacing of the shear reinforcement? Consider fy = 400 MPa (58,000 psi) and f'c = 30 MPa. (4,350 psi).

A. 535 mm (21.1").
B. 350 mm (13.8").
C. 196 mm (7.7").
D. 140 mm (5.5").

ME56.



What is the punching shear resistance of a footing with Fc' = 30Mpa (4350 psi)? Assume d= 505 mm (19.9").

A. 1235 kN (278 kips).
B. 2264 kN (513 kips).
C. 2470 kN (555 kips).
D. 4588 kN (1031 kips).

Section F

MF45. When using the current edition of the British Columbia Building Code for designing a building, the following code is legally required to be used:

A. The designer can use either CAN/CSA-S16.1-94 or CAN/CSA S16-01 as table 2.7.3.2 does not apply to buildings designed under part IV of the building Code.
B. As Table Tables 2.7.3.2. and A-2.7.3.2. of the 1998 British Columbia Code originally referenced S16.1-94 the designer must use the most restrictive clauses from CAN/CSA-S16.1-94 and CAN/CSA-S16-01.
C. CAN/CSA-S16-01.
D. The most beneficial clauses from CAN/CSA-S16.1-94 and CAN/CSA-S16-01 as this will produce the most economical design.

MF47. You have designed a building with several square HSS columns. Your design was done using G40.21 Class C HSS members and has been reasonably tight with several of the members working close to their design capacity. The steel fabricator has sent you a Request for Information asking that ASTM A500 Grade C (Fy = 345 MPa) be substituted as there is a shortage of some of the G40.21 HSS members you have specified and the fabricator wants to keep the project on schedule. It is proposed that the same member sizes be used just changing the member steel standard. Without compromising the compliance of your design with the Code your response should be:

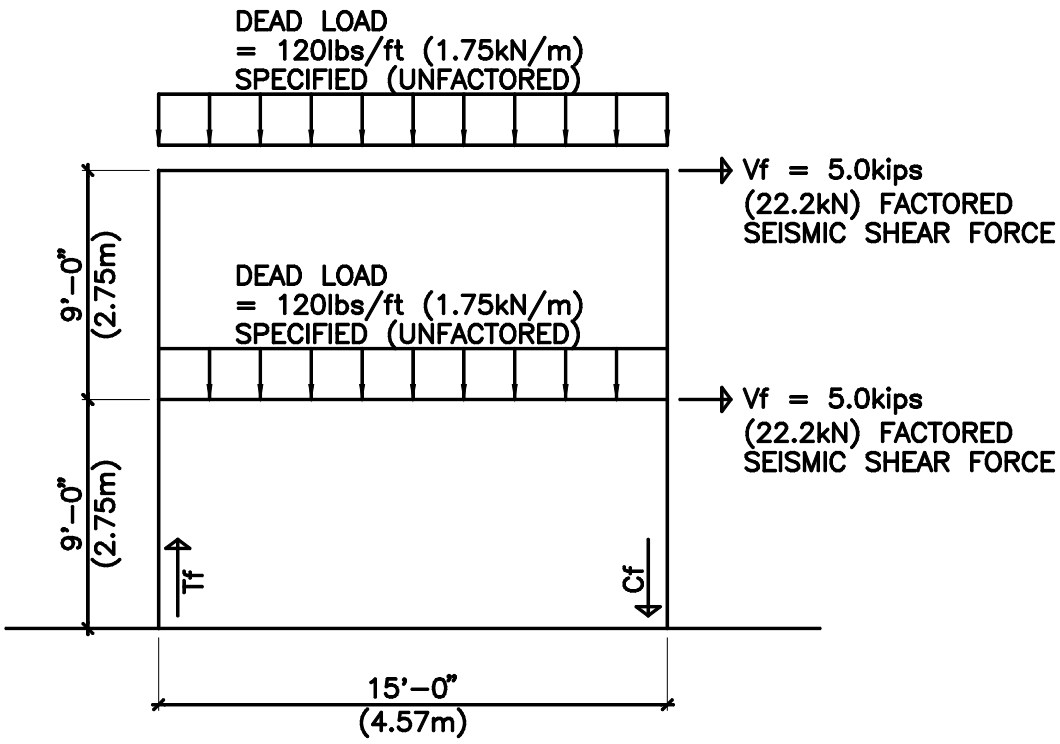
A. A500 steel is not approved for use in steel structures covered by S16-01 and you have rejected the fabricators proposal.
B. Even though your design is tight it is not so tight that the 1.4% between Fy=350 and Fy=345 is significant enough to cause a delay and you have accepted the fabricators proposal.
C. You have accepted that the A500 material can be used but have included in your response a table of alternate member sizes that must be used that take account of the manufacturing tolerances and yield for the material.
D. You have accepted the change in material provided that coupon tests are taken that show the material has a yield of at least 350 MPa.

Section G

MG11. Due to material shortages, a free standing column supporting a roof structure is built up from 4 - 2x6 SPF No 1/2 studs. The column height is 3.0m (10ft) and the factored total load is 80 kN (18kips). Which of the following nailing patterns meets the CSA 086-01 requirements for nailed built-up columns?

A. 2 rows of 3" nails @ 4" (100mm).
B. 2 rows of 4½" nails @ 6" (150mm).
C. 2 rows of 6" nails @ 8" (200mm).
D. 1 row of 6" nails @ 4" (100mm).

MG23. Diagram G-9



What is the factored uplift force that a holddown will be required to resist at the lowest level of the shearwall system shown in Diagram G-9?

A. Tf = 18.7 kN (4.2 kips).
B. Tf = 26.2 kN (5.9 kips).
C. Tf = 32.0 kN (7.2 kips).
D. Tf = 37.8 kN (8.5 kips).

Section H

MH40. Under Part 4 of the B.C. Building Code, what is the seismic load for brick veneer ties design for a school in Victoria (v = 0.3), where the cladding weight is 1.60 kPa?

A. 2.08 kPa.
B. 2.40 kPa.
C. 3.12 kPa.
D. 9.36 kPa.

MH44. What maximum spacing of 10M single legged stirrups (f_y = 400 MPa) is required in a beam constructed of standard weight, two-core 190 mm block with a d of 1100 mm, for a factored shear resistance provided by shear reinforcement of 55 kN?

A. 400 mm.
B. 500 mm.
C. 600 mm.
D. 800 mm.

Answers

Section A
MA20 – D

Section B
MB14 – B
MB28 – C

Section C
MC37 – C
MC47 – C

Section D
MD12 – A

Section E
ME52 – C
ME56 – B

Section F
MF45 – C
MF47 – C

Section G
MG11 – C
MG23 – C

Section H
MH40 – C
MH44 – A