Electrical Wiring Residential (Canadian) 7th edition Mullin Solutions Manual

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Unit 2 Drawings and Specifications
Solutions to Review

Note: For these exercises, refer to the blueprints provided with this textbook. Also, refer to the *CEC* when necessary. Where applicable, responses should be written in complete sentences.

PART 1—DRAWING PLANS

1. Identify three line types shown on Sheet 2.
   Centre lines, border lines, hidden lines, dimension lines, visible lines

2. Determine the length of the lines for the following.

SCALE	LENGTH
1:50	**3 m**
1:75	**4.5 m**
1:100	**6 m**
⅛″ = 1 ft	**19 ft, or 5.71 m**
¼″ = 1 ft	**9 ft 6 in, or 2.9 m**

3. What is the purpose of specifications?
   To supplement the plans by providing written information on materials and to the methods of construction.

4. In what additional way are the specifications particularly useful to the electrical contractor?
   They allow the contractor to prepare an accurate cost estimate without having to find all the data in the plans.

5. What is done to prevent a plan from becoming confusing because of too much detail?
   Symbols are used that refer to a table or notes. Information is supplied in the specifications.

6. Name three requirements contained in the specifications regarding material (Appendix A).
   a. **Shall be all new**
   b. **Size and types specified**
   c. **Carry a label from an approved testing organization.**

7. What are the two main hazards that the *CEC* is designed to prevent?
   a. **Shock**
   b. **Fire**

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8. What phrase is used when a substitution is permitted for a specific item in a specification?
   "or equivalent"

9. What is the purpose of an electrical symbol?
   To represent electrical equipment and components.

10. What is a notation?
    A note providing additional or more specific information.

11. List five electrical notations found on the plans for the residence used as an example in this textbook. Refer to the blueprints provided with this textbook.
    Found on the electrical drawing sheets. E6 is as follows:

1) CENTER OF WP RECEPTACLES TO BE 450 mm ABOVE FINISHED GRADE. GENERAL CONTRACTOR TO SET BOXES HORIZONTAL IN MASONRY OR SIDING

2) PORCELAIN LAMPHOLDERS TO BE INSTALLED IN ATTIC ABOVE FOLDING STAIRS, KITCHEN,LIVING ROOM AND MASTER BEDROOM. TOTAL OF 4.

3) PROVIDE TR, G.F.C.I. AND A.F.C.I. AS REQUIRED BY THE CANADIAN ELECTRICAL CODE

4) ALL SMOKE ALARMS TO BE OF THE AC/DC TYPE AND BE INTERCONNECTED TO PROVIDE A SIMULTANEOUS SIGNAL.

5) CENTRE ALL SWITCHES 1300mm A.F.F. RECEPTACLE OUTLETS 300mm A.F.F. RECEPTACLES ABOVE COUNTER TOPS 1100mm A.F.F. (A.F.F. ABOVE FINISHED FLOOR)

6) CENTRE T.V. OUTLETS 300mm A.F.F.

7) CENTRE PHONE OUTLETS 300mm A.F.F. UNLESS OTHERWISE NOTED.

8) INSTALL TWO EMPTY TRADE SIZE 27mm EMT RUN FROM BOTTOM EDGE OF WORKSHOP CEILING JOIST THRU PARTITION BETWEEN HALL AND BEDROOM CLOSET TO 300 mm ABOVE ATTIC JOIST. SECURE BOTH FIRMLY AND CAP TOP ENDS

9) FLUORESCENT LIGHT ABOVE WINDOWS IN STUDY/BEDROOM TO BE MOUNTED INSIDE PREVIOUSLY INSTALLED VALANCE.

10) INSTALL POLYETHYLENE VAPOUR BOOTS ON ALL BOXES. INSTALL IN WALLS AND CEILINGS ABUTTING AN UNCONDITIONED AREA

11) ALL PENETRATIONS OF BUILDING VAPOUR BARRIER TO BE SEALED WITH APPROVED SEALANTS

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The following is found on the electrical drawing sheets. E5 is as follows:

1) ALL SMOKE/CARBON ALARMS TO BE OF THE AC/DC TYPE AND BE INTERCONNECTED TO PROVIDE A SIMULTANEOUS SIGNAL.

2) ALL SWITCHES TO BE CENTERED 1.3m ABOVE FINISHED FLOOR EXCEPT FOR TWO ABOVE WORKBENCH, WHICH WILL BE 1.2m A.F.F. ALL RECEPTACLES TO BE CENTERED AT 300mm ABOVE FINISHED FLOOR EXCEPT FOR THE WET BAR AND WORKSHOP, WHICH WILL BE 1.1m UNLESS OTHERWISE NOTED.

3) CENTER TV OUTLETS 300mm FROM FINISHED FLOOR.

4) PHONE WALL BOX IN RECREATION ROOM TO BE 150mm TO THE RIGHT OF WET BAR AND CENTERED AT 1.6m ABOVE FINISHED FLOOR.

5) ALL ELECTRICAL PANELS TO BE MOUNTED ON 13mm PLYWOOD

6) LAY IN LUMINARIES (4 LAMPS) ARE .6m x 1.2m W/WATT-MIZER F32 SP30/RS/WM FLORESCENT LAMP. COORDINATE INSTALLATION W/ CEILING CONTRACTOR.

7) LUMINARIES "A" AND LUMINARIES ON LANDING OF STAIRWAY CONTROLLED BY 3-WAY SWITCHES.

8) CEILING FAN SPEED CONTROL IN RECREATION ROOM TO BE INSTALLED IN 100mm SQ x 50mm DEEP BOX WITH SINGLE-GANG PLASTER RING.

9) FREEZER RECEPTACLE SINGLE TYPE

10) INSTALL 2 EMPTY 27mm EMT RUNS FROM THE BOTTOM EDGE OF THE WORKSHOP CEILING JOIST THROUGH PARTITION BETWEEN HALL AND BEDROOM CLOSET 300mm ABOVE ATTIC JOIST. SECURE BOTH FIRMLY AND CAP TOP ENDS.

PART 2—STRUCTURAL FEATURE

1. To what scale is the basement plan drawn?
   See plans. 1:50

2. What is the size of the footing for the steel support columns in the basement?
   610 x 610 x 305

3. To what kind of material will the front porch lighting bracket fixture be attached?
   The fixture will be supported by fastening it to the electrical outlet box, which is set into the wood siding.

4. Give the size, spacing, and direction of the ceiling joists in the workshop.
   50 x 255 @ 305 on centre, running front to rear.

5. What is the size of the lot on which this residence is located?
   30 x 46 m

6. In what compass direction is the front of the house facing?
   30 x 46 m

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7. How far is the front garage wall from the curb?
   10.67 m

8. How far is the side garage wall from the property lot line?
   9.145 m = 7620 (garage to set back) + 1525 (setback measurement)
   (shown on DWG #1 Site plan)

9. How many steel support columns are in the basement, and what size are they?
   5 columns @ 76 mm outer diagram (shown on DWG #2 Basement)

10. What is the purpose of the I-beams that rest on top of the steel support columns?
    To support the floor joists.

11. Is the entire garage area to have a concrete floor?
    Yes.

12. Where is access to the attic provided?
    In the garage.

13. Give the thickness of the outer basement walls.
    305 mm

14. What material is indicated for the foundation walls?
    Poured concrete.

15. Where are the smoke detectors located in the basement?
    One in the workshop near the entrance way; one at the foot of the basement stairs.

16. What is the ceiling height in the basement workshop from bottom of joists to floor?
    (DWG#4 Section A-A) 2690 - 255 = 2435 mm

17. Give the size and type of the front door.
    813 x 2032 x 45 mm decorative with /light Sheet 7 under Door schedule

18. Who is to furnish the range hood?
    The electrical contractor. Appendix A, number 15.

19. Who is to install the range hood?
    The electrical contractor. Appendix A, number 19.

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