Assignment

Supplemental Floor Plan Drawings

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Chapter 19, page 459

Question 19–1 Duplex convenience outlets in living areas should be a maximum of how many feet apart?

Duplex receptacles must be spaced no more than 12' (3657 mm).

Question 19–2 Duplex convenience outlets in living areas should be no more than how many feet from a corner?

. Outlets are required every 4' (1200 mm) of counter space, no more than 2' (600 mm) from a corner

Question 19–3 Describe at least four energy-efficient considerations related to electrical design.

• Use energy-saving fluorescent fixtures where possible, such as in the kitchen, laundry/laundry room, garage or store.

• Select energy efficient appliances such as a

heated dishwasher or a highly insulated water heater. Evaluate the seller's energy declaration before buying.

• Insulate completely above and around recessed lighting fixtures. Check code and manufacturer's specifications for this practice.

• Carefully caulk and seal around all lights and convenience outlets. Also, caulk and seal where the wires

electric currents enter the upper and lower plates.

Question 19–4 Draw the proper floor plan symbol for:

a. Duplex convenience outlet
b. Range outlet
c. Recessed circuit breaker panel
d. Phone
e. Light
f. Wall-mounted light
g. Single-pole switch
h. Simplified fluorescent light fixture
i. Fan

Question 19–5 Why is it poor practice to place a switch behind a door swing?

because opening the door prevents any possibility of using the duplex socket

Question 19–6 What is a GFCI duplex convenience outlet?

Electrical - Ground-Fault Circuit Interrupters

Question 19–7 The average single-family residence should be equipped with how many amps of electrical service?

For service capability, the average single family residence should be equipped with a 200 amp service entrance.

Question 19–8 Define *outlet box.*

An electrical connector used to plug in devices. A duplex outlet, with two outlets, is the typical wall plug

Question 19–9 When does rough-in of electrical wiring take place?

framed and covered with a roof. Electric meter and permanent service can also be installed at this time nd does rough installation of electrical wiring take place?

Question 19–10 Define *outlet.*

outings to convenient locations

Question 19–11 Define *lighting outlet.*

lights containing a socket

Question 19–12 What is the code requirement for the spacing of outlets in a kitchen?

8' (2400 mm) spacing is preferable to code requirement

12' (3600mm). Outlets should be at least 15" (380mm) above the floor rather than the normal 12" (300mm).

Question 19–13 Give two possible abbreviations for the ground fault circuit interrupter.

ground

Question 19–14 Define *structured wiring systems.*

Structured cabling systems are high-speed voice and data lines and video cables wired to a central service location. These wires and cables optimize the speed and quality of the various communication signals entering and leaving the house

Question 19–15 Where are smoke detectors required?

Smoke detectors are required at each bedroom and on each additional floor and basement of a residential unit

Chapter 20, page 483

Question 20–1 Floor plan plumbing symbols are generally drawn at what scale?

Plumbing fixtures are drawn in their appropriate location on the floor plan at a scale of 1/4" = 1'–0" (1:50 metric).

Question 20–2 Identify at least four methods that can contribute to energy-efficient plumbing.

• Insulate all exposed hot water pipes. Cold water lines should be insulated in climates where freezing is a problem.

• Wherever possible, install water lines in isolated spaces.

• Keep water lines away from exterior walls whenever possible.

• Place thermosiphon traps in hot water lines to reduce heat loss due to excess hot water in the lines. Thermosiphon is the general term for the rise of hot fluid and the descent of cold fluid.

Question 20–3 Define the following plumbing abbreviations:

a. CO
b. FD Drinking water fountain
c. VTR Ventilation
d. WC A device designed for washing hands and face, usually found in a bathroom.
e. WH Water heater
f. SH Shower

Question 20–4 What information is required on a plumbing schedule?

A plumbing fixture schedule can provide fixture type, manufacturer name, model number, and color columns

Question 20–5 Are plumbing drawings required by all contractors? Why or why not?

Question 20–6 List at least one advantage and one disadvantage of solar hot water systems.

• A solar water heater does not work at night, so you have to invest in a A solar water heater uses an available and renewable source of energy.

• very well insulated storage tank to have hot water available in the morning.

Question 20–7 Briefly explain how public sewer and private septic systems differ.

Public sewers are available in and near most

towns and villages. Public sewers are usually located under the street or an easement next to the construction site. In

some situations the sewer line may need to be extended to accommodate the addition of another home or business in an area

newly developed.

A septic system consists of a storage tank and an absorption field and works as follows. Solid and liquid waste enters the septic tank, where it is stored and begins to break down into sludge

Question 20–8 What is the name for steel pipe that has been cleaned and dipped in molten zinc?

A galvanized pipe

Question 20–9 Give the name of a steel pipe, protected with a coat of varnish, that is used for natural gas.

. This pipe is commonly referred to as black pipe due to its color

Question 20–10 Briefly describe CSST.

CSST is a flexible piping system that is easier and less expensive to install than black pipe.

Question 20–11 Why is stainless steel pipe often used in chemical, pollution control, pharmaceutical, and food industries?

Stainless steel piping is commonly used in

chemical, pollution control, pharmaceutical and food industries due to its corrosion resistance

Question 20–12 Define *soil pipe.*

Waste pipe: A pipe that carries only liquid waste free of feces

Question 20–13 Give the proper term for a vented fitting that provides a liquid seal to prevent the emission of sewer gases without affecting the flow of sewage or wastewater.

Question 20–14 Define *vent pipe.*

The pipe installed to vent the building's drainage system and to prevent the suction of liquid out of the traps and the stopping of the back pressure

Question 20–15 List at least four factors that influence the sizing of water supply pipes.

• Quantity of water required.

• Supply pressure.
• Pipe length.

• Number of stories to provide.

Chapter 21, page 520

Question 21–1 Describe the following heating and cooling systems:

a. Central forced air : One of the most common heating and cooling systems circulates air from living spaces through or around heating or air conditioning units.
b. Hot water: In a hot water system, water is heated in an oil or gas boiler and then circulates through pipes to radiators or convectors in the rooms.
c. Heat pump: A heat pump is a central forced-air heating and cooling system that operates using a compressor and a refrigerant circulation system.
d. Zoned heating: A zoned heating system requires one radiator and one thermostat per room. No ductwork is required and only the heaters in occupied rooms should be turned on.

Question 21–2 Describe a type of zoned heating called *radiant heat.*

Radiant heat can be obtained with oil or gas heated hot water piping in the floor or ceiling, to electrical coils, cables or fixtures in or above the ceiling gypsum board, and transferred to metal radiator panels usually mounted by means of a bracket approximately 1" (25 mm) below the ceiling surface**.**

Question 21–3 List two advantages and two disadvantages of zonal heat as compared with central forced-air heating.

advantages

Heating comfort: the continuous and looped circuit of the central heating allows excellent heat distribution. Distributed evenly, the heat is pleasant and always remains the same, unlike electric heating which works according to the desired temperature, alternating heating cycles and breaks which can affect comfort.

disadvantages

Energy storage: some boilers run on wood or fuel, or even LPG, and this implies that the individual must have sufficient storage space a tank for fossil fuels, a silo for wood pellets and a space fitted out for logs

Question 21–4 A heat pump may supply up to how many times as much heat per year for the same amount of electrical consumption as a standard electric forced-air system?

Heat is extracted from the outside air and pumped inside the building. The heat pump provides up to three times more heat per year for the same electrical consumption than a standard forced-air electric heating system.

Question 21–5 Discuss four factors that influence the placement of a thermostat.

The key to successful thermostat placement is finding a stable location where an average temperature reading can be obtained. There should be no drafts that negatively affect the temperature settings. The thermostat should not be placed in a location where direct sunlight or heat register will cause an unreliable reading. The same assumption suggests that a thermostat should not be placed near an exterior door, where temperatures can change rapidly. Thermostats should be placed on interior partitions rather than on exterior walls,

which could lead to false temperature readings. Avoid locating the thermostat near stairs or similar traffic areas, where

Bounces or strong jolts could cause the mechanism to change the actual reading.

Question 21–6 Describe five sources that can contribute to an unhealthy living environment.

• Incomplete combustion of gas appliances or wood-burning stoves and fireplaces can generate a variety of pollutants, including carbon monoxide, aldehydes and soot. Carbon monoxide is a colorless, odorless and poisonous gas produced by the incomplete combustion of carbon-based fuels. Aldehydes are highly reactive organic compounds that contribute to the production of ozone. Soot is carbon

finely deposited by flames during the incomplete combustion of organic substances such as coal.

• Humans and pets can transmit bacterial and viral diseases through the air.

• Tobacco smoke adds chemicals to the air that can affect smokers and non-smokers alike.

• Formaldehyde, when present, is considered a factor in causing eye irritation, certain diseases and respiratory problems. Formaldehyde is a chemical found in disinfectants, preservatives, carpets, furniture, and glue used in building materials, such as plywood and particle board, and some insulation products.

• Radon is a naturally occurring radioactive gas that breaks down into carcinogenic (cancer causing) compounds when large amounts are inhaled over a long period of time. Radon may be more apparent in a building with large amounts of concrete or in certain areas of the country. Radon can be scientifically monitored at nominal cost, and barriers can be built to help reduce concerns about radon contamination. Radon monitoring and control is recommended later in this chapter.

Question 21–7 Discuss the function of an air-to-air heat exchanger.

An air-to-air heat exchanger is a heat recovery and ventilation device that draws polluted, stale, warm air from the living space and transfers the heat from this air to the fresh, cold air drawn into the living space. home. Heat exchangers do not produce heat; they only exchange heat from one air stream to another.

Question 21–8 List five advantages of a central vacuum system.

• Affordability; some systems cost no more than a major appliance.

• Increase in the sale value of the house.

• Elimination of dirt too heavy for most portable units.

• Removal of dirt and dust from the home or office.

• No engine block or electrical cords; however, there are often long pipes.

Question 21–9 What does the size of heating and cooling equipment have to do with providing access clearances for servicing and replacement?

Heating and cooling equipment should be located with clearances allowing access for maintenance and replacement of the largest piece of equipment. This replaces the minimum requirements.

Question 21–10 Define *combustion air.*

A fan forces air through sheet metal or plastic pipes called ducts, which connect to openings called air supply diffusers or registers. Hot air or cold air passes through the ducts and the

Question 21–11 List the rooms or locations where return air cannot be accessed.

return air must come from inside the dwelling and can be mixed with outside air. Return air cannot be taken from kitchens,

bathrooms, garages or other living units. Outside air should not be taken within 10" (3048 mm) of any appliance or

plumbing vent outlet located less than 3" (914 mm) above the air inlet.

Question 21–12 What does the abbreviation *UL* stand for?

short for Underwriters Laboratories

Question 21–13 Give the minimum thermal resistance value for insulated ducts.

• Insulated ducts must have a minimum thermal resistance value of R 4.2. Insulate ducts in unconditioned areas

Question 21–14 Define *plenum.*

A plenum is a chamber that can serve as a distribution area for heating or cooling systems, typically between a

false ceiling and the ceiling itself, or between elements of

construction. When a conduit can be in a space created

between building elements, no additional framing is required to conceal the ducts.

Question 21–15 Describe the purpose of schedules in an HVAC drawing.

HVAC system drawings show the size and location of all equipment, ducts and components with precise symbols, specifications, notes and schedules which form the basis of the contractual requirements for construction

Bibliography

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