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You are viewing sample pages from our program of studies:

***“Residential Design and Construction Program”***

The first pages you see are the complete Lesson 4 from the Construction Practice Module of the program. The information presented is for use by the instructor and provides a general description of the lesson, lists points to cover, ties the points to specific overhead reference numbers and to the relevant page of the textbook.

Following the lesson plan you will find five examples of the overhead master pages referenced in the lesson plan. There a total of nineteen overheads for this Lesson.

If you require more information about the contents of this book, please contact us directly at: [info@micro-press.com](mailto:info@micro-press.com).

# LESSON 4

## CONSTRUCTION and DESIGN

### CONSTRUCTION PRACTICE

#### SUMMARY

This lesson introduces the students to the concepts of the three main framing methods; platform framing, balloon framing, and post and beam. Platform framing is also covered extensively in Course 3, Framing, and does not need to be overly emphasized here, unless the Framing Course is not offered by your institution. The second part of the lesson introduces house design styles and roof shapes, with the intention of showing the students how combinations of style and roof shape can provide a wide range of perceived architectural designs.

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#### 4.1 **Platform Framing**

##### **Overhead #CP4-1 Page #6-4**

- \* Using the overhead, point out the individual members of the structure in this type of construction.
- \* It is important that the students are totally aware of the elements of platform construction and I suggest that you draw on the chalk board, in simplified form, each element of the frame, clearly showing the relative positioning and erection sequence. The erection sequence is most important, since this is one of the major factors that distinguish it from balloon framing.
- \* Discuss the advantages of safety, firestopping, and relatively equal shrinkage.

#### 4.2 **Balloon Framing**

##### **Overhead #CP4-2 Page #6-5**

- \* Using the overhead, discuss the significant elements of this type of framing as you did for platform framing.
- \* Discuss the disadvantages of balloon framing, including two-story studs, lack of firestopping, and difficulty of erecting floors.
- \* Emphasize that this method is rarely used in modern construction, but will be encountered when renovating or otherwise working with older buildings.

### 4.3 **Post and Beam Framing**

#### **Overheads #CP4-3, 4 Page #9-2**

- \* Using the first overhead, describe the general arrangement of a post and beam frame using transverse beams. Again, be sure to detail the erection sequence.
- \* Using the second overhead, discuss the visual impression that tends to be created by this beam and plank arrangement.

#### **Overheads #CP4-5, 6 Page #9-3**

- \* Repeat the same sequence as above, this time for the general arrangement of a post and beam frame using longitudinal beams.

#### **Overheads #CP4-7, 8 Pages #9-6, 9-7**

- \* Discuss the range of materials and fabrication options available in this type of construction. While addressing these options, also discuss the advantages and disadvantages of the different arrangements in terms of the building's utility services (see page 9-5 for this information).
- \* Also discuss the range of wall infill panels available, from standard stud framing and finishes to specialized prefabricated and prefinished insulated panels. These specialized panels also apply to the roof construction.

#### **Overhead #CP4-9 Page #9-4**

- \* Introduce the concept of combining post and beam with standard frame construction, to obtain some of the visual benefits of post and beam without the expense or difficulty of a full post and beam structure. Discuss the variety of visual options possible with this hybrid method.
- \* You may wish to delve deeper into post and beam framing if this is a popular construction method in your region. If so, I suggest that you add overheads of the typical design and fabrication methods shown on pages 9-8 to 9-13. If you also have slides or other audio-visual material available, so much the better.

### 4.4 **Basic House Styles**

- \* This part of the lesson encourages the students to recognize the four basic house styles which form the basis of almost every residential design. Discuss each in turn, highlighting the important features of each arrangement. In each of the illustrations, the plan views match the pictorial views for direct comparison.

#### **Overhead #CP4-10 Page #3-2**

- \* Bungalow style, also sometimes called a Ranch.
- \* Generally, the most expensive to build and heat and cool, because of the large roof to floor area ratio (see Course 2, Energy Efficiency, for more information).
- \* Easiest for traffic flow, with all functions on one level.
- \* Additional option is a raised-bungalow, with the main floor raised above the ground level, allowing an entry level that is split between the main floor and the basement, all connected with short stair flights.

**Overhead #CP4-11 Page #3-3**

- \* Two-story and one-and-one-half story styles, with dormer window options shown for the latter.
- \* Separate social functions, with main floor-to-floor stairs required.
- \* Best economic option for single-family occupancy in terms of roof/floor area ratios.

**Overheads #CP4-12 and 13 Page #3-4**

- \* Back-split and side-split styles. Explain the difference between the two layouts with the plan views.
- \* It also helps to explain how a split level occurs by using the chalk board to first draw the cross-section of a two-story design and then redraw with the split in place.
- \* Discuss the possibility of further splitting one of more of the levels to create a multiple-split design.

**Overhead #CP4-14 Page #3-5**

- \* Semi-detached and multiple dwellings. Explain the differences between each layout using the plan views.
- \* This type of design is less likely to be constructed by the general public and may be glossed over if desired, unless your audience contains a number of contractors, in which case you should include more information.
- \* Lowest cost per unit of all the styles because of the shared walls on one or both sides. Same for utility costs.

4.5 **Roof Shapes**

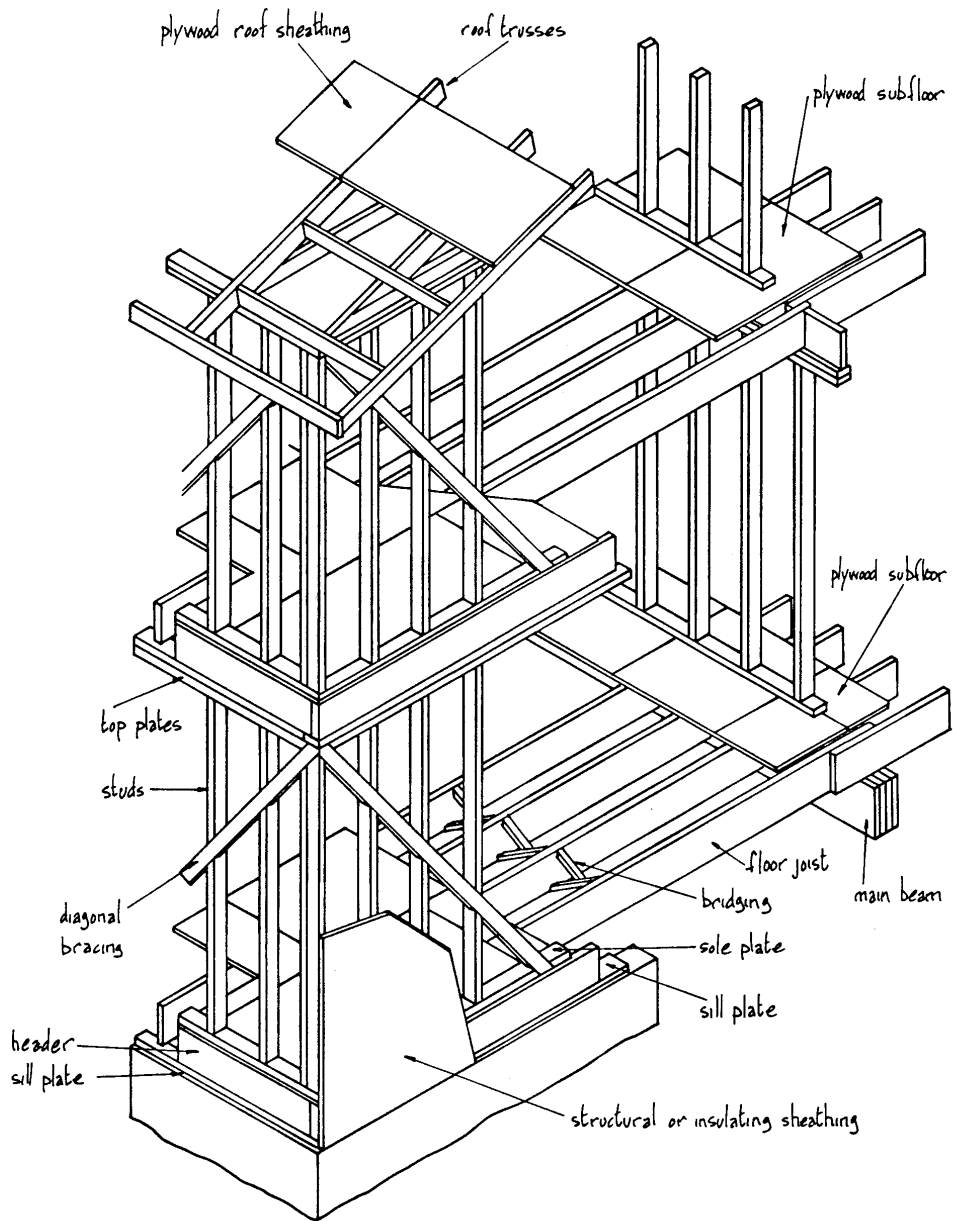
**Overhead #CP4-15 Page #8-2**

- \* Using the overhead, discuss the three basic roof shapes that are the basis for all roof designs.
- \* Along with the roof shapes are the possible locations of the ceiling plane in each case.
- \* Itemize the main points of each shape.

**Overheads #CP4-16 to 19 Pages #8-4 to 8-7**

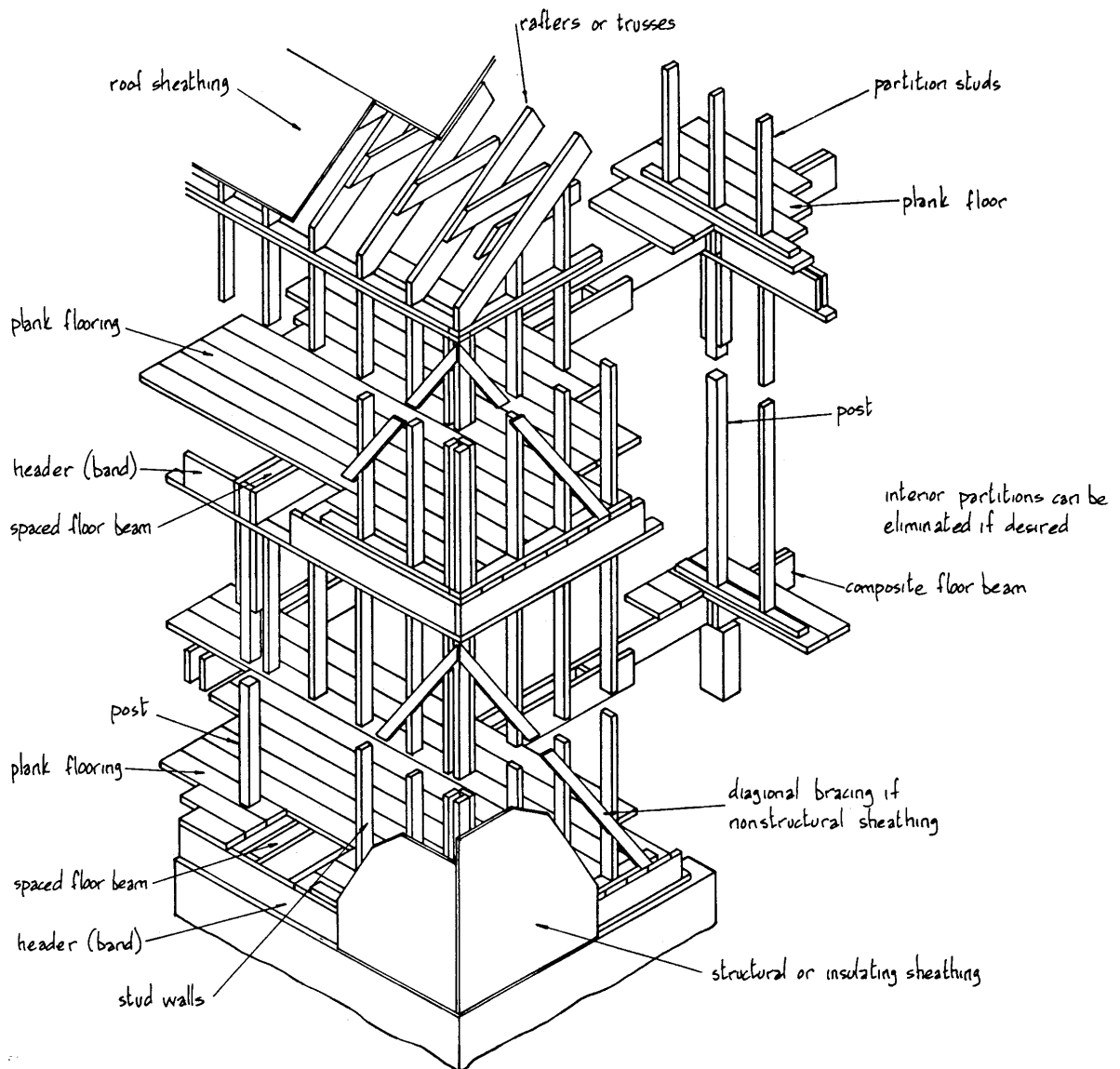
- \* Using the next four overheads, discuss the features of the six roof types most used in residential construction.
- \* Point out that these pictorials are intended to show only the simplest representation of the shapes. In reality, many designs combine two or more of the shapes to create a wide variety of interesting roofs.
- \* To supplement this visual information, I would suggest you assemble a collection of slides taken of the more interesting roof shapes in your region. Modern designers seem to be getting very pointed and complicated in their roof shapes, which are very hard to describe without further visual assistance.

Next follow five of the nineteen overhead master pages for this lesson plan.



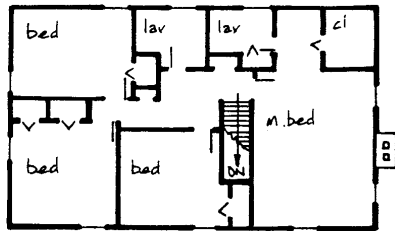
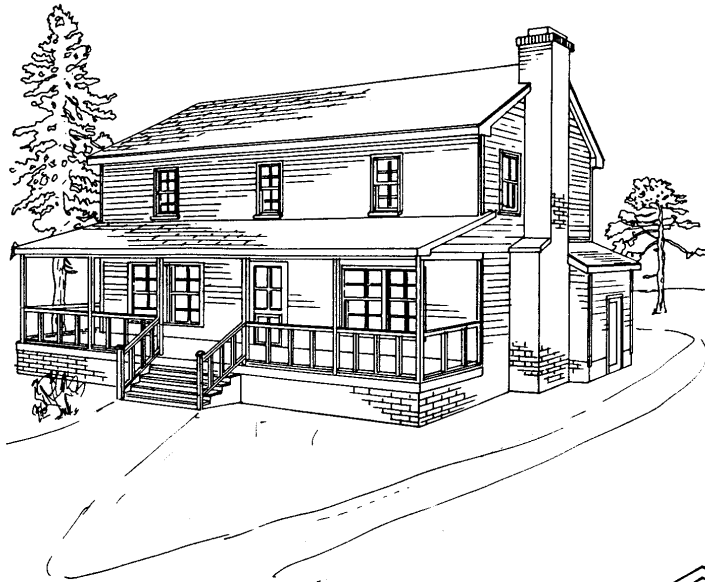
## PLATFORM FRAMING

CPA-1

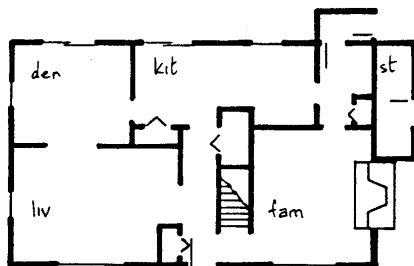


## COMBINED POST AND BEAM AND CONVENTIONAL FRAMING

CP4-9

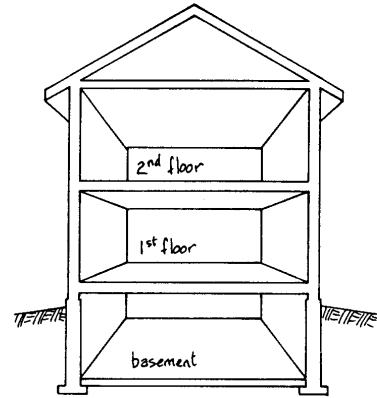


Second Floor

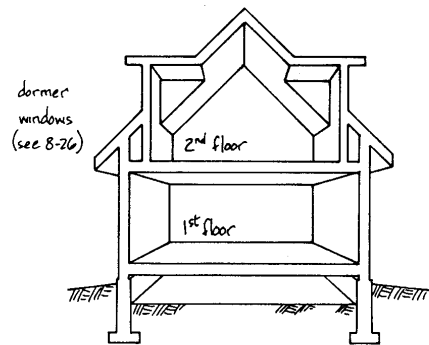


First Floor

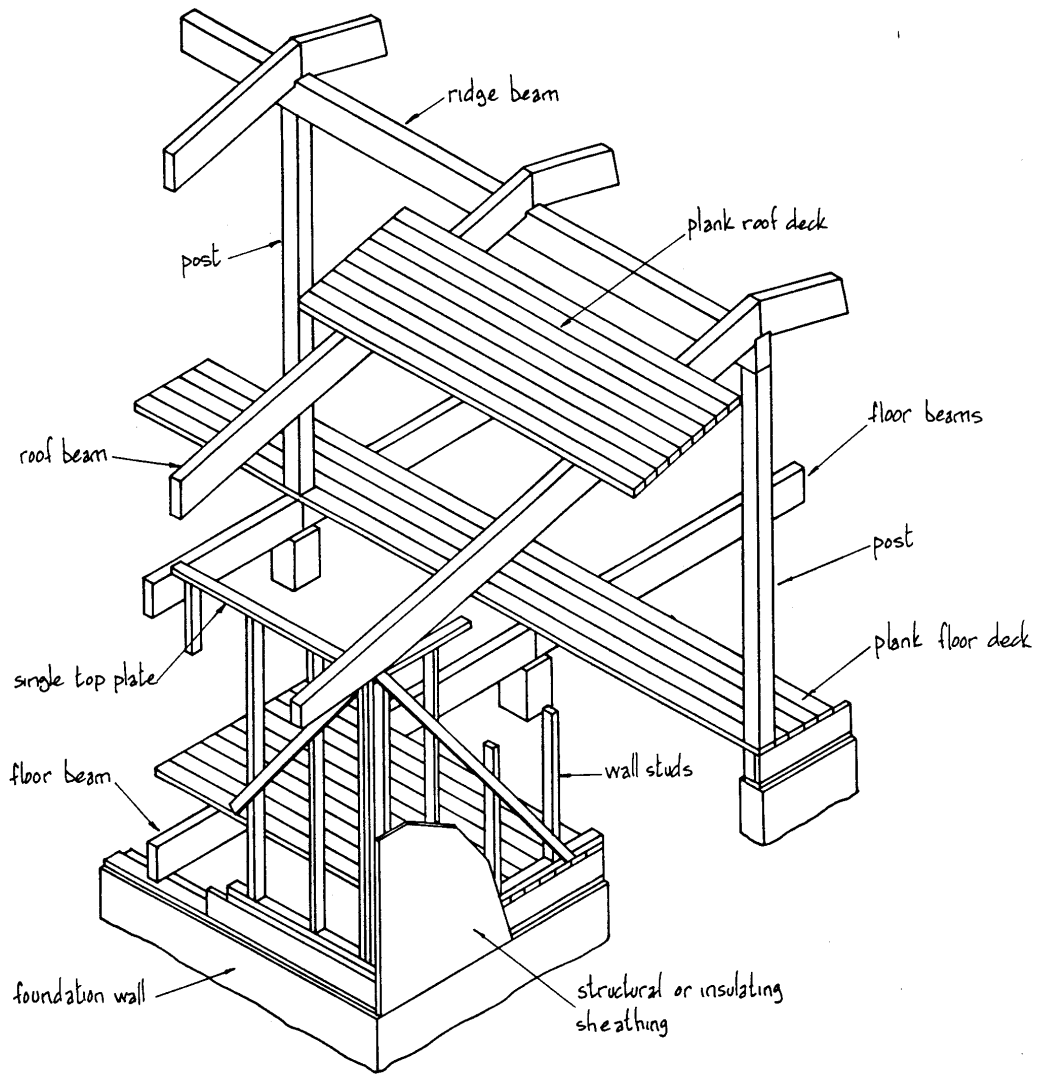
Typical First and Second Floor Plans for Two-Story House



Typical Section - Two-Story with Basement

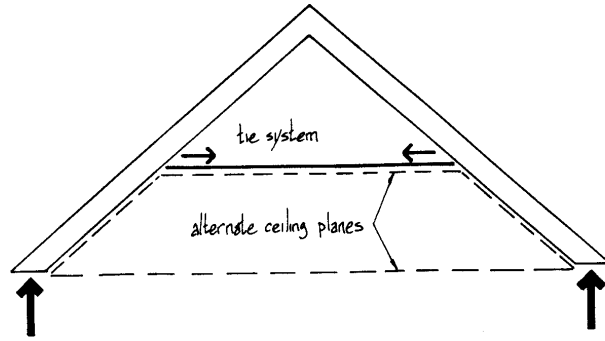


Typical Section - One and One-Half-Story with Crawl Space

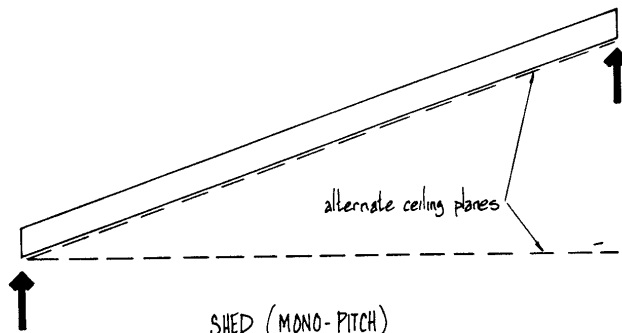


## TRANSVERSE BEAMS

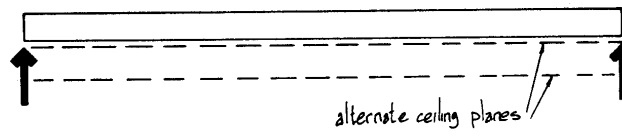
CP4-3



PITCHED



SHED (MONO-PITCH)



FLAT

BASIC ROOF SHAPES

CP4-15