The complete structural design of a steel building frame is an involved process, but it begins with the laying out of a framing plan, which can be rather simple for many buildings. See Figure 11.42 in the text for an example of a typical structural steel framing plan.

Usually the bay spacings in a steel frame are kept to about 36’ (11 m) or less in order to minimize the size of the beams and girders, and bay sizes are kept constant except where interruptions such as elevator shafts and stairs occur. A good way to begin laying out a framing plan is to use freehand overlays on tracing paper to try dividing the building plan into a number of different sizes and shapes of bays, until one layout shows promise of working better than the others.

Then special arrangements of beams and girders, much like the headers and trimmers used around openings in platform frame wood floors, must be designed to frame around stairs and shafts. Move lines of columns on tracing paper until you arrive at a simple, logical layout that avoids excessive irregularities. (Usually the architectural plan can be adjusted slightly if necessary to arrive at a satisfactory framing plan.) Check to be sure that the layout does not involve excessively long spans, which are costly, or spans that are so short that they require too many columns and/or cut the habitable space of the building into too many little pieces.

Within a typical bay, the layout of girders, beams, and decking should be done with the aid of the rules of thumb on page 356 of
the text. Select a trial depth and type of deck, and lay out girders
to support the beams or joists. Determine preliminary depths for
each of these members--are they reasonable? If not, adjust spacings
and sizes until they are.
You are designing an 8- to 10-story regional office building in downtown Omaha, Nebraska, for Associated Mutual Casualty and Life Corporation. Three possible plan arrangements for a typical floor of the building are shown below and on the following page. Draw a feasible framing plan over each of the plans, and give approximate depths for the typical beams and girders. Assume that you will use W10 columns.