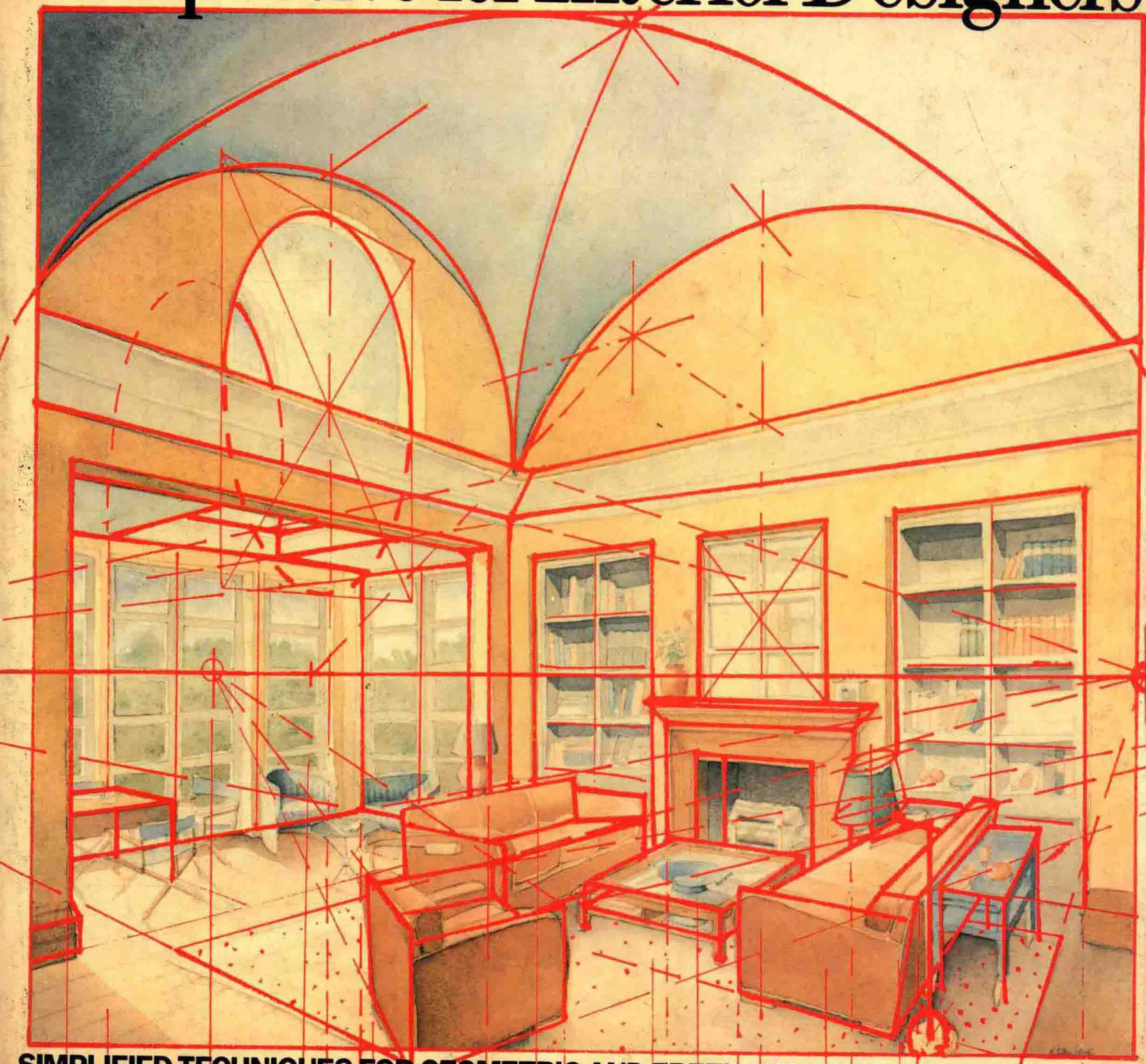
Perspective for Interior Designers



SIMPLIFIED TECHNIQUES FOR GEOMETRIC AND FREEHAND DRAWING BY JOHN PILE

Perspective for Interior Designers

BY JOHN PILE

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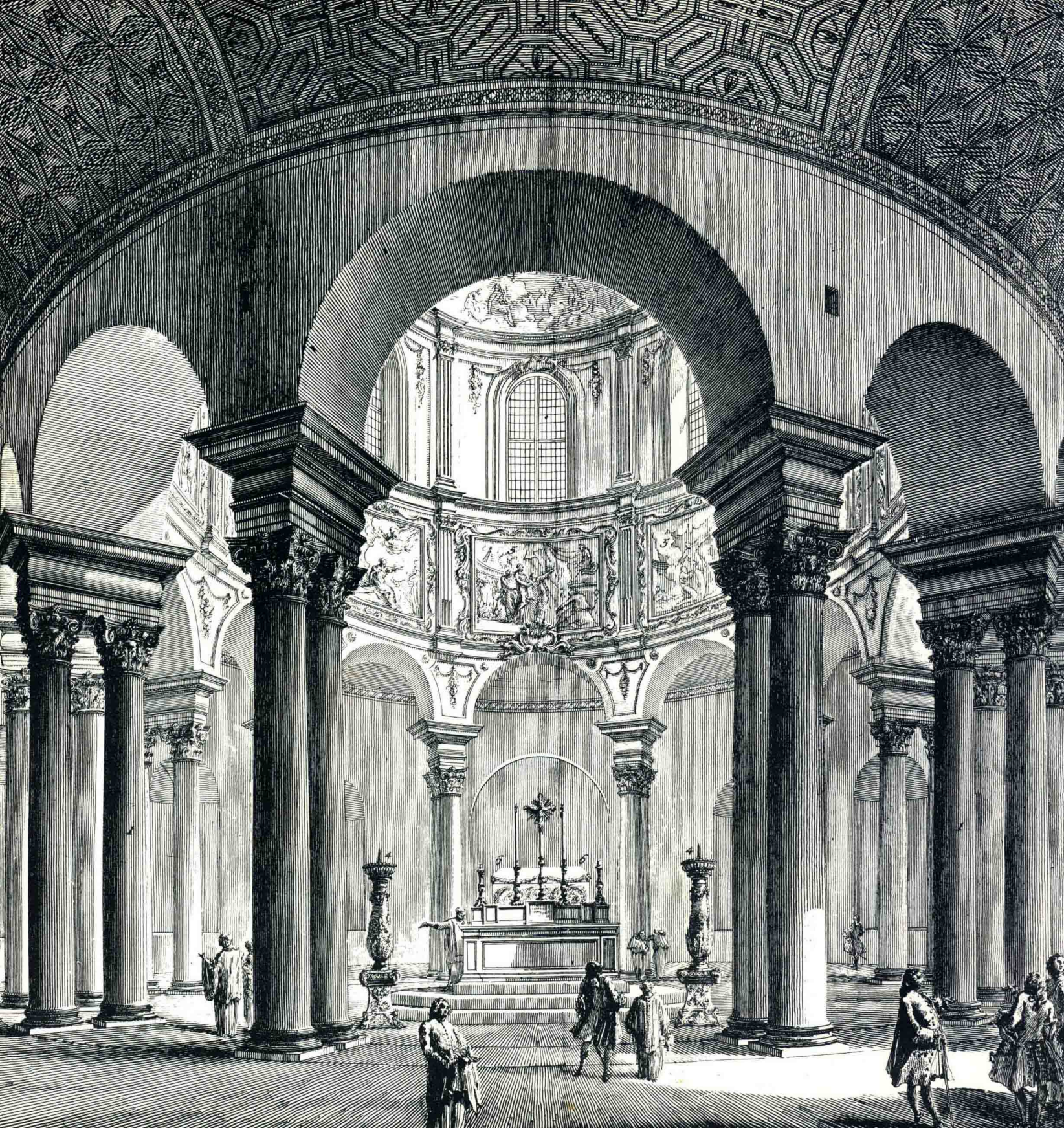

An interior of Santa Constanza in Rome by Giovanni Battista Piranesi, circa 1748–91 (from Antichita Romane*). The realistic perspective was the only available pre-photography way of representing architectural space in a convincing way. By choosng a station point outside the space, Piranesi was able to provide a "better" view than could be seen on site. Ellipses representing circles and parts of circles are laid out with exemplary accuracy.*

Introduction

FROM PRIMITIVE TIMES through the Middle Ages, artists struggled with only limited success to find a way to show scenes as they actually appear to the human eye. People, animals, and single objects were drawn with striking realism, but buildings and spaces within buildings were represented in ways that now seem strange and quaint. It was not until the Renaissance that a more scientific approach to drawing applied the concepts of geometry to the making of the kind of realistic view that we now call "perspective." As the artists of the Renaissance learned this methodology, it became possible to draw and to paint exterior and interior views in a way that we now can call "photographic."

The development of lenses, the camera obscura (with pinhole and later with glass lens), and finally the invention of photography gradually made perspectives so commonplace that they now seem to be the only truly "realistic" way of presenting the world. For architects and designers, perspective drawing has become a basic tool for showing design proposals in a way that is fully understandable to a public that is not prepared to decipher architectural plans, elevations, and sections.

Learning to make perspectives is a part of every beginning design curriculum. Unfortunately, it is the experience of many design students that the way in which perspective is usually taught (as a branch of descriptive geometry involving a confusing tangle of points, lines, and planes) makes the subject something of a mystery and an obstacle in the way of mastering design drawing. The fact that the subject is often presented in an abstract way before it is actually needed in design work also contributes to making the technique hard to put into daily practice.

Design instructors find it necessary to organize "perspective clinics" to try to aid students who are trapped in a hopeless struggle with a technique remembered only dimly from an early "basic" course. The matter is also made more difficult both in introductory courses as well as in later remedial efforts (and, all too often, in books on the subject) by a common urge to introduce shortcut methods using fixed viewpoints or other formulas that are supposed to make things easier. In

practice, shortcuts are usually only applicable to a limited range of situations and tend to delay the student's mastery of the basics.

If all this is true of perspectives of objects and buildings, interior perspectives seem to present an even more troublesome problem. Methods are usually presented in ways that deal with a solid object viewed from outside. When the view moves to the inside of a hollow space, all the rules seem to be turned inside out in a confusing way. Students and beginners in interior design seem to be plagued by drawings of strangely distorted spaces in which furniture floats with legs suspended above the floor or with round table tops rolling downhill in a distressing and mysterious way. Methods in which a nightmare of little squares are suggested as an aid to dealing with these problems only make the matter worse.

Interior perspective drawing can be learned fairly easily and can even be self-taught if shortcuts are put aside and the basic method mastered. It is the purpose of this book to offer such a basic method that will serve every interior design drawing need and that can be learned in a very short time. It is assumed that the reader is already familiar with plan, section, and elevation drawings and has fluency in the use of pencil and basic drafting tools. Any memories of shortcut methods, gadgets, or charts should be put aside while the method described here is practiced.

Reading alone is not likely to make the technique familiar or easy. Instead, it is suggested that the reader begin at once at the drafting board with a perspective layout and follow the steps described in this book as closely as possible. At first it might be best to choose a simple imaginary space similar to the one used in the illustrations in Chapters One and Two. Be sure, however, to incorporate enough differences in spatial form, dimensions, and details of design to make a fresh problem. Next, try several different spaces in different angular positions and then try to draw an actual space (existing or planned) from real plan and elevation drawings. Making a measured plan of a familiar room (one's own living room, for example) and then drawing several perspectives from different points of view will help to make the basic method become easy and natural.

Once the basic method is familiar, the various special situations (such as one-point perspective) should be tried out with the more difficult problems of drawing circular forms, irregular spaces, and spaces containing furniture in various positions. It may be tempting to leave some of these matters until needed for an actual project, but the sense of mastery that comes from having dealt with every situation in advance is well worth the time it takes to produce a variety of layouts. Setting out to practice some particularly difficult problems—for example, drawing a spiral stair in an irregular room with some mirrored wall surfaces—is a good way of building confidence in one's ability to deal with any problem, no matter how complex.

Analysis of published perspective drawings, along with study of photographs and the way in which the camera generates perspectives, can also be helpful. This book does not attempt to deal with techniques of rendering, which may be needed to convert a line perspective into a presentation drawing. Many excellent books deal with this subject, and several are suggested in the selected bibliography offered.

All perspective drawing makes use of the commonly observed phenomenon that distant objects appear smaller than objects of the same size seen close up. The related way in which horizontal lines seem to slope up or down is not quite as obvious, but is easily demonstrated by the often illustrated view of a road or railroad tracks diminishing and seeming to disappear in the distance. These phenomena result from the fact that the lens of the eye projects an image onto the retina that produces a perspective because of the geometry that the laws of optics generate. By presenting to the eye an image on a flat surface in which these optical effects are recreated, a retinal image is produced that corresponds to the image that would be generated by reality.

The geometric means for creating this illu-

sionistic image were discovered and codified by artists during the Renaissance, and it is their system of drawing horizons and vanishing points and measuring out diminishing units of space to give the illusion of distance that is the basis of perspective drawing today. Once learned, the logic of the system becomes self-explanatory, but to the uninitiated it remains an almost magical trick by means of which a few oddly placed lines can suddenly create the illusion of three-dimensional reality. Once mechanical perspective is learned, freehand perspective becomes easy to master and drawing from reality in accurate perspective even easier.

Modern computer drafting systems now offer programs that can create perspective images almost instantly from the data provided by plans and elevations. These techniques make it possible to change viewpoint, move objects about in a space, and create effects of movement through a space simulating a moving picture. All such computer techniques are based on programs that translate the geometric basis of perspective into computer language and memory. However, the equipment needed is complex and expensive; the programs are highly specialized and require a great deal of computer capacity. Thus, the ability to accomplish in a few minutes with one's own hands, pencil, and paper the same tasks that a powerful computer will find demanding remains a valuable skill and a source of satisfaction. Computer-generated perspective layouts will probably soon become commonplace, at least in large design offices. But the designer's hand and pencil remain the tools most likely to produce drawings that are personal, expressive, and at best, works of art.

TOOLS

Perspective drawing does not require special tools or equipment other than the standard drafting materials. A fairly large drawing board is a convenience, since vanishing points are often far apart and may fall beyond the edge of a small board. A parallel rule straightedge is often not as convenient as an old fashioned T-square, since many lines will angle up or down. If a parallel rule is in place, it can be used for horizontals and to hold triangles to establish verticals, but it will be helpful to have a fairly long straightedge (T-square or plain rule) at hand as well.

Ordinary drafting triangles will serve well—a large one is useful at times. Ellipse templates can be helpful when circular forms are to be drawn. The maximum number of sizes and proportions that can be afforded will give the widest range of uses. French curves will help in drawing ellipses not available as templates.

Yellow (cream) tracing paper is the best material for layout and is often used in layers. A good grade white tracing paper is needed for more finished drawings. "Clearprint" is a favorite brand. A good assortment of pencils (2H, H, F, HB, and 2B will serve), a roll of drafting tape, and a few pins are the only other materials needed.

DEFINITIONS

Special terms used in this book are generally defined when they are first used. A few basic terms are listed here for easy reference.

Cone of Vision. The cone (a V in plan) within which a clear view can be had from a fixed viewing position. It is usually considered to have an angle of 60°, sometimes increased to 90° at the cost of some distortion.

Ellipse. The geometric figure that best represents a circle seen in perspective at an oblique angle. Ellipses must be correctly drawn to avoid distortion.

Height Line. The vertical line along which true heights can be measured; usually the backmost corner of an interior space.

Horizon. A horizontal line passing through a perspective at eye level. Vanishing points are normally placed on the horizon.

Major Axis. The longest dimension of an ellipse. When a circle in a horizontal plane is placed in perspective, its major axis must be horizontal.

Minor Axis. The shortest dimension of an ellipse. It is always at right angles to the major axis.

One-Point Perspective. A perspective in which one system of parallel lines in plan are parallel with the picture plane. Only one vanishing point can be used, since the other vanishing point(s) are at infinity.

Picture Plane. The imaginary vertical plane on which the perspective image is projected. It is represented in plan by a horizontal line.

Sight Line. A construction line, sometimes called a "ray," coming from the station point and passing through a particular point in plan. It is then extended to the picture plane to locate that point horizontally in the perspective.

Station Point. the location of the imagined viewer whose image of the space will be represented in the perspective. It is represented by a point in plan, which is usually circled and marked SP.

Three-Point Perspective. A perspective in which the imagined viewer looks upward or downward instead of on an exact horizontal. This will cause vertical lines to appear slanted, moving toward a third vanishing point located above (when looking upward) or below (when looking downward) the perspective being drawn. Three-point perspective is rarely used in architectural drawing; it is usually preferable to see all verticals in actuality represented as verticals in perspective.

Two-Point Perspective. A perspective developed from a plan placed at an oblique angle to the picture plane so that two vanishing points, one point at left and one point at right, are developed.

Vanishing Point. A point toward which a particular system of horizontal lines appears to converge. Normally, vanishing points lie on the horizon. They are marked by a point, which is usually circled and labeled VP, or VPL and VPR (for left and right), in two-point perspectives.

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