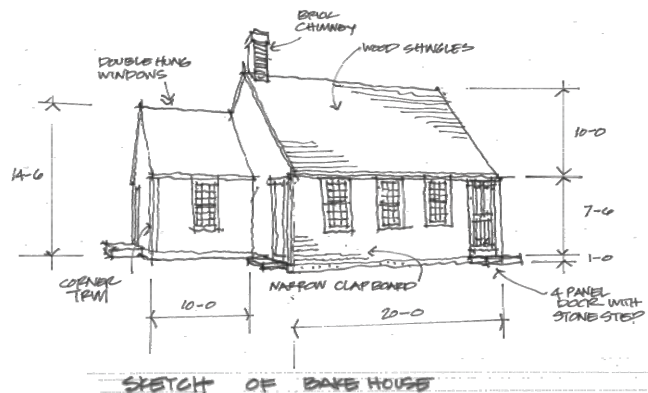
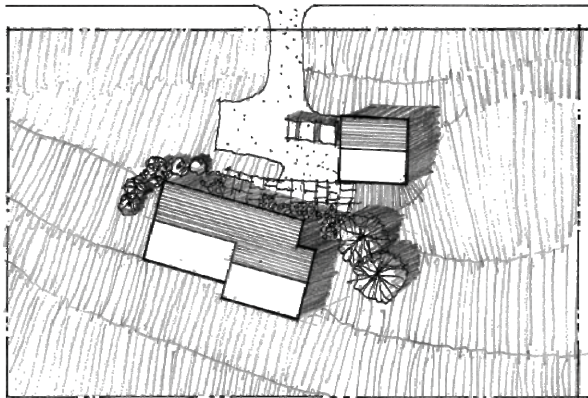


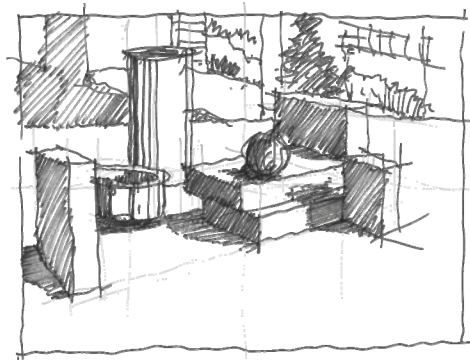
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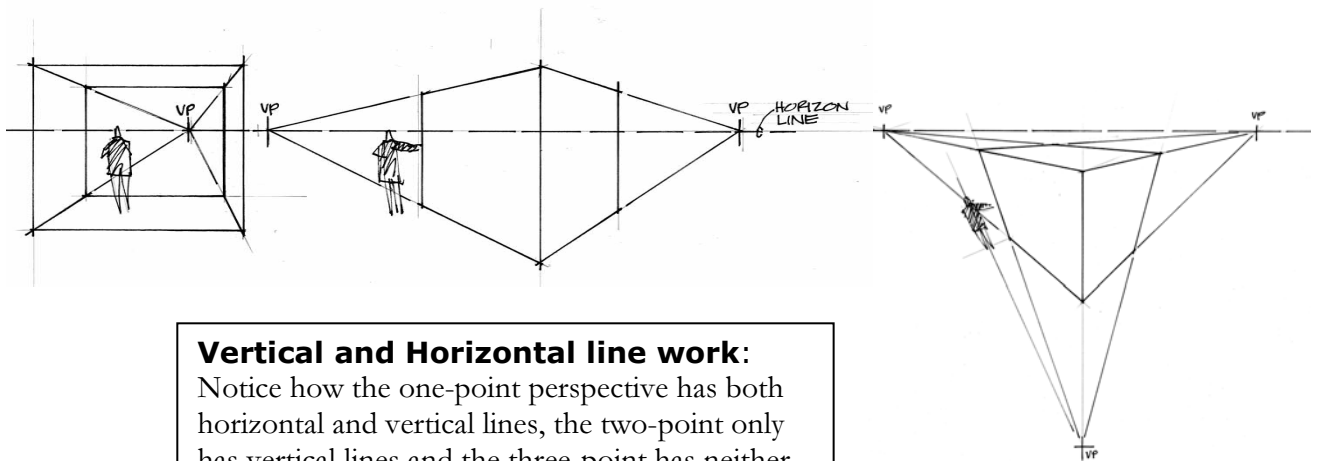


The Perspective: Two-Point I

At this point you should have a comfort level with your pen sufficient to begin exploring the fundamentals of the perspective drawing. This is an exciting step in learning to draw because you can see the drawings begin to “come to life”!

A perspective drawing is a two-dimensional drawing which represents a three-dimensional object or scene *and* takes into account the phenomenon that things appear to get smaller the further they are from the viewer. There's a bit more to it than that (which you will cover in this chapter), but this is a working definition we will start with. Additionally, a perspective drawing looks very much like what we perceive when looking at the world.

Below are the three primary types of perspective created by Architectural Designers: *[from left to right]* one-point, two-point and three-point perspectives.



Vertical and Horizontal line work:

Notice how the one-point perspective has both horizontal and vertical lines, the two-point only has vertical lines and the three-point has neither.

The Horizon Line

One of the first things you need to understand when it comes to perspective drawing is the *Horizon Line* – what it is and how it relates to the drawing. In the simplest of terms, the *Horizon Line* is the edge of the earth; at least the edge as it is perceived from the eye. As the earth curves away from any one person's view, they see a distinct line between the earth and the sky. Even though the earth is round, it is so large that it appears to be flat. When drawing a perspective drawing this important reference line is assumed to be flat (i.e., horizontal).

In most perspectives, renderings and photographs you don't usually see the *Horizon Line* because it is obscured by trees, hills, buildings, etc. However, there are some cases in which you do see it, such as when you have the ocean or a vast field as a backdrop to your building.

The photo below helps to understand the *Horizon Line* by providing a real-world example. This example is of a building pictured with a large body of water behind it (this is not an ocean, but it is the largest freshwater lake in the world – by surface area – Lake Superior). Notice the *Horizon Line* labeled in the picture.



Understanding the Horizon Line

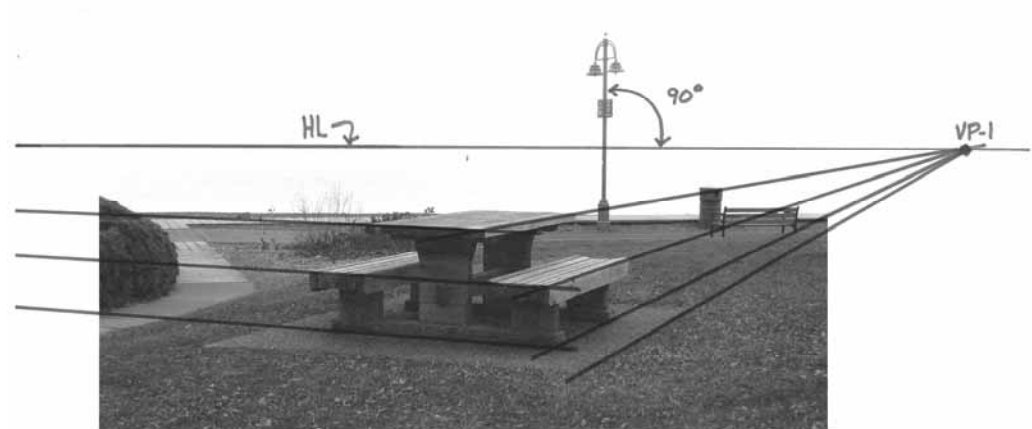


Another quick example of the *Horizon Line* is shown in the photo below. A simple picnic bench is not much different than a building when it comes to perspective; it has four sides and a top.

You should pay close attention to the sketched overlays on this page and the previous one. These overlays should make clear the close relationship between a hand drawn perspective (which you will learn how to do in this chapter) and a photograph (or, better, what you see with your eyes)!



Understanding the Horizon Line



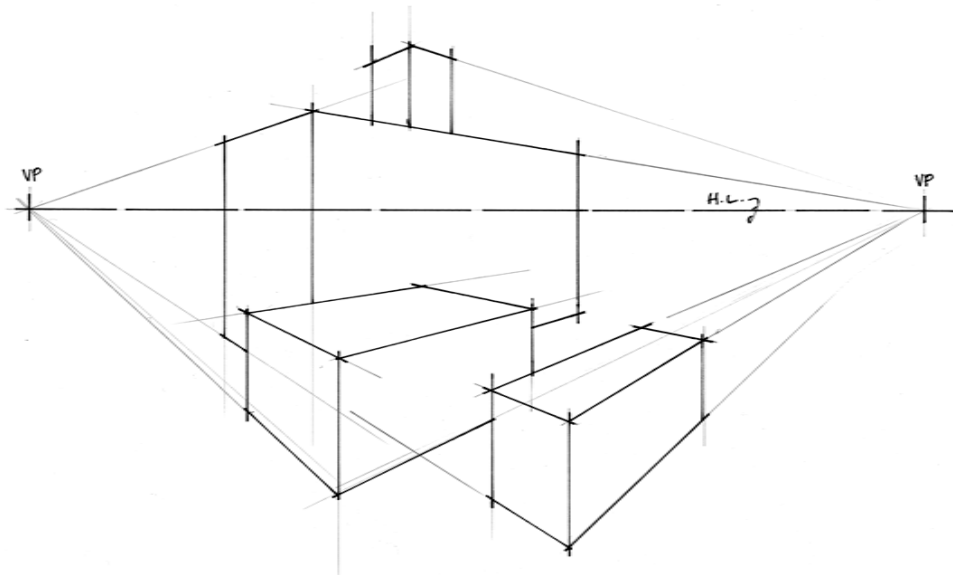
The ***Vanishing Point*** is not something visible as is the *Horizon Line*. However it is possible to locate the *Vanishing Points* by extending lines back until they converge (as shown above). The lines will always converge on the *Horizon Line* and thus reveal the *Vanishing Point* for the object under consideration.

The Two-Point Perspective

Two-point perspective drawings are two-dimensional drawings that represent three-dimensional objects or scenes. As the name implies, there are two points, referred to as *Vanishing Points* – VP. These points establish the perspective lines which are both relative to a *Horizon Line* (HL). The object being depicted has three primary types of lines:

- *Perspective lines*, which always converge at the *Vanishing Points*.
- *Vertical lines*, which are always truly vertical to the page.
- *Angled lines*, which are usually drawn by ‘connecting-the-dots’ via line work fully developed from the previous two line types.

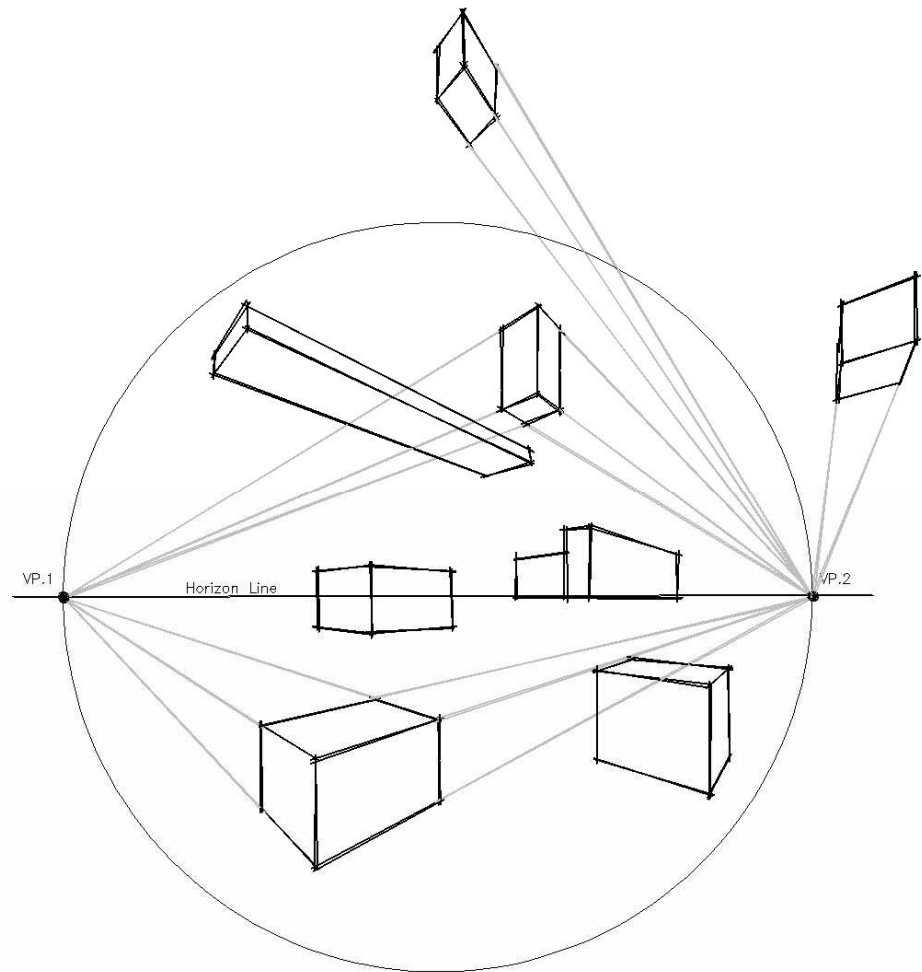
Two-point perspective drawings are primarily meant for rectilinear objects. For example, a uniform series of blocks can be sketched much easier than an ‘organic’ shaped suburban development.



The concepts covered can be applied to more detailed embellishments such as windows and siding, sidewalks and driveways, fences and garages.

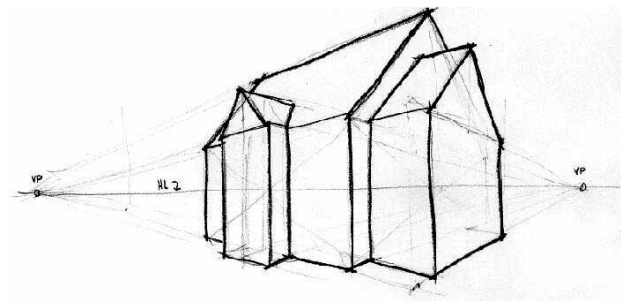
In the image above you should take a moment to notice a few things:

- 1) All lines are either vanishing or perfectly vertical.
- 2) Anything drawn outside of an imaginary circle (actually shown on the next page) is too distorted and should be avoided.
- 3) Objects completely below the horizon are as viewed from the top (aerial view, like from an airplane), and objects completely above are as viewed from below (worm’s eye view). You can quickly create rectilinear objects in any shape or size by sketching the vanishing lines and vertical lines as shown!



Two-Point Perspective

The following exercise will walk you through the steps required to develop a two-point perspective of the exterior of a residence. You are encouraged to follow along on a separate piece of paper or in a sketch book. The exact dimensions and proportions do not really matter at this time as you are focusing on the mechanics of perspective drawings. Try drawing this freehand first and then try again using a straightedge.



The bulleted steps on the next page relate to the 'lettered' and then 'numbered' sketches on the opposite page:

Main building with gable roof – Image A

This first step is simply sketching a basic box with a gable roof element dropped on top. You should try to make your sketch as similar as possible in terms of proportions – the vertical centerline (centered between the two *Vanishing Points*) has been added to aid in this.

1. Draw a vertical line just to the right of the ‘centerline’ with equal portions above and below the *Horizon Line* (see one vertical line marked with a #1).
2. Connect-the-dots: draw four lines from the *VP*’s to the top and bottom of the vertical line as shown (see four lines marked with a #2).
3. Draw two vertical lines to define the overall size of the main building.
4. Draw an ‘X’ and a vertical line at its intersection to discern the midpoint of the gable end of the building. (**Note:** It is not the midpoint of the bottom edge of the building – confirm this with a scale).
5. Draw the ridge line of the roof: a line from *VP*-1 to the vertical line sketched in the previous step. (The location of this line determines the pitch of the roof; higher = steeper.)
6. Connect-the-dots: draw lines to create the gable roof edges.
7. Lightly sketch the hidden portions of the building as shown.

Bisecting the building – Image B

Here you will learn how to find the exact middle of the building, this will help in locating the cross-gable in the next image/task.

1. Sketch an ‘X’ on the bottom plane of the building.
2. Draw a perspective line from *VP*.2 which passes through the ‘X’.
3. Sketch three vertical lines as shown (the vanishing line just drawn helped establish the starting point on the front and back face of the building).
4. Connect-the-dots: from the intersection of the roof and three vertical lines.

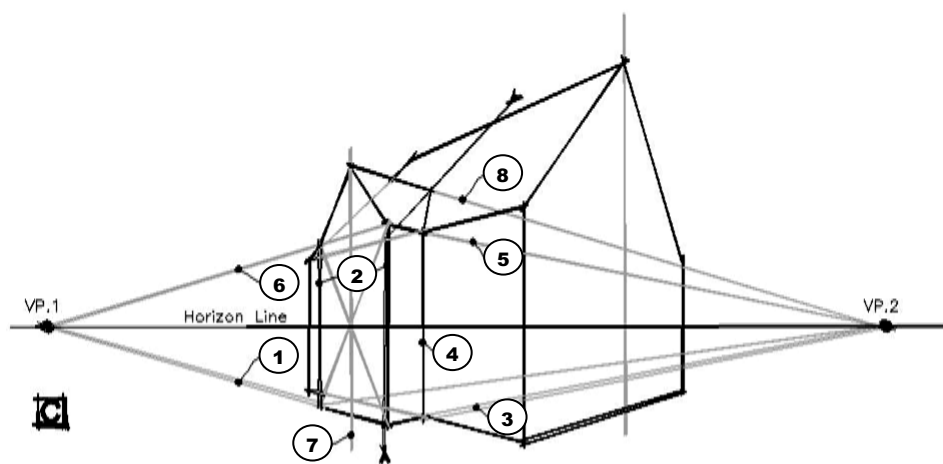
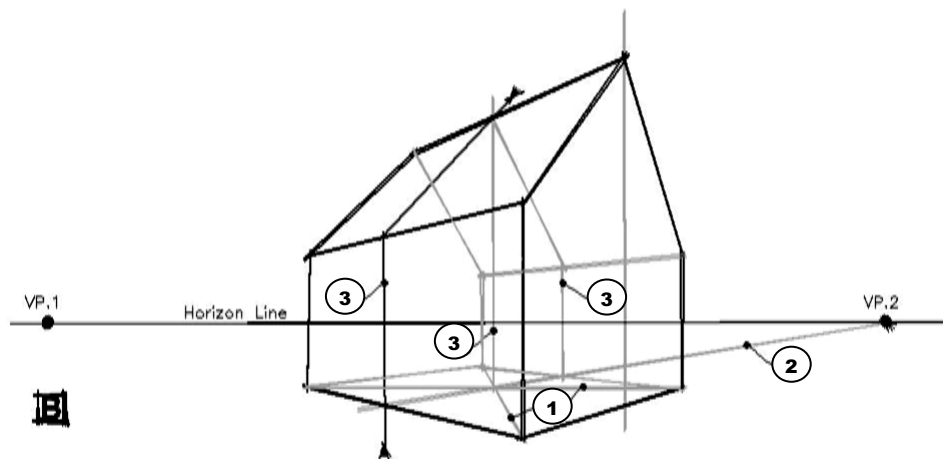
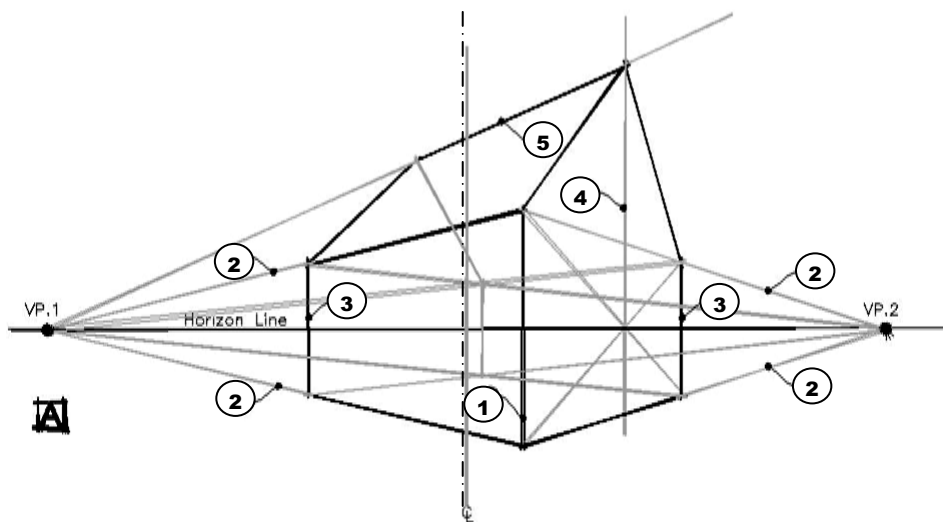
FYI: The two visible bisecting lines have an arrow at the top and bottom in this image and the next one to make them stand out – these lines will eventually be erased.

Adding cross-gable entry – Image C

Next you will sketch in the “bump out” on the front of the building.

1. This perspective line (*from VP.1*) determines how far “out” the “bump” will be.
2. Draw two vertical lines a certain distance apart and approximately centered on the main building (you will learn to be more precise later).
3. Draw two perspective lines (*from VP.2*) to establish the bottom edges.
4. Draw a vertical line up to the roof edge – from the intersection of the perspective line just drawn and the bottom front edge of the main building.
5. Do the same as step three to establish the top edges (*from VP.2*).
6. Draw this perspective line (*from VP.1*) to verify the top-front edge is correct.
7. Use the ‘X’ method to discern the center of the gable wall.
8. Sketch the ridge line of the entry roof – the location determines roof slope.
9. Connect-the-dots: the remaining valley lines can be easily drawn.

All lines should be sketched very lightly with pencil and the visible lines can be made darker at the end, as well as erasing the unneeded reference lines and hidden lines.



Centered and symmetrical addition – Image D

The following steps show you how to make an extrusion off the main building which is symmetrical. You cannot measure in from each side an equal distance because things get closer together as you approach the *Vanishing Points*.

1. The first line (*from VP.2*) will determine how large the extrusion (or addition) will be from the main mass of the residence.
2. Here you will basically extend the front and back bottom (i.e., grade) line out to the previous line drawn. (Sketch lightly as these lines will be erased.)
3. Draw an 'X' in the large, flat, rectangle just created.
4. Now you will draw a vanishing line (*from VP.2*) near the building. The intersection of this line and the 'X' lines will establish the front and back wall locations for the addition (which will be drawn in the next step).
5. Draw two lines (*from VP.1*) so that they pass through the intersection of the 'X' (from step 3) and the perspective line (from step 4), and terminate these lines at the perspective line drawn in step 1) – as shown in image D.

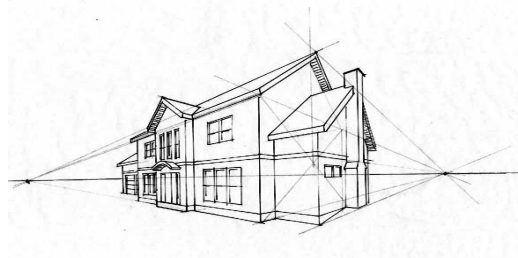
Completing the massing of the addition – Image E

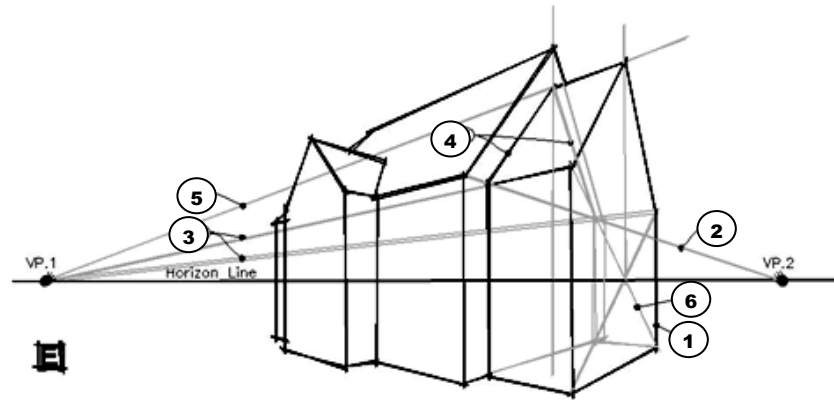
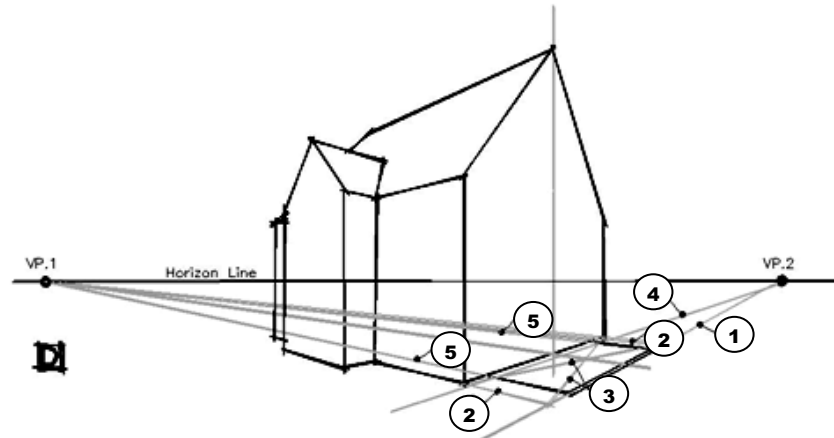
Now that the footprint of the addition is sufficiently developed you can create the remaining line work.

1. Draw four vertical lines as shown.
2. Draw a perspective line (if needed – i.e., if you erased the previous one you drew) – from VP.2 to the roof edge of the main building. This assumes the roof edge of the addition will align with the main building and not be lower (simply swinging this perspective line down a bit would allow for this change).
3. Draw two vanishing lines (*from VP.1*) through the line drawn in the previous step and the vertical lines at the main building (drawn in step 1).
4. Finding the middle of the gable end of the main building, you can sketch the roof slope lines. This is done in conjunction with the next step which locates the ridge line.
5. Draw the ridge line (*from VP.1*).
6. Find the middle of the gable end of the addition and finish sketching the sloped roof edges.

At this point you have developed the main masses of your structure. Now you can erase the reference lines and hidden lines, and then darken the remaining lines. Another option is to use tracing paper and a soft pencil to sketch a new image based on the 'visible' lines of your original sketch.

Again, you may use these techniques to add windows, siding, trim, chimneys and such. Here is another good use for tracing paper: you can sketch different window and siding options on the tracing paper, so you don't need to start from scratch with the base model every time!





If you really want to develop your sketching skills, you should try to draw some non-architectural objects. This will help you create more lively architectural renderings!



The Human Scale Method



One challenge we often have when sketching in perspective is making all the various parts at the proper scale. This gets easier with practice and experience, but until then you need to be able to use a few tricks to establish scale or even to double check parts of your previously drawn perspective. In this section you will learn about a technique called the **Human Scale Method**, which uses a 6 foot tall measuring stick (i.e., a person) to size up objects in the perspective.



When sketching a building, a designer may get the overall building correct, but then they may make the windows too small or the door too large; this has a negative impact on the perceived aesthetics of the design. The *Human Scale Method* projects the height of a person around the scene to compare and verify vertical heights. For example, if you project the six foot person's height onto the face of your building and the second floor windows are not approximately "another person" in height above (i.e., 12 feet total) something is probably wrong.

In the following tutorial you will learn how to create a simple rectangular building with a gable roof using the *Human Scale Method*.

Step A – the horizon, a vanishing point, and a person

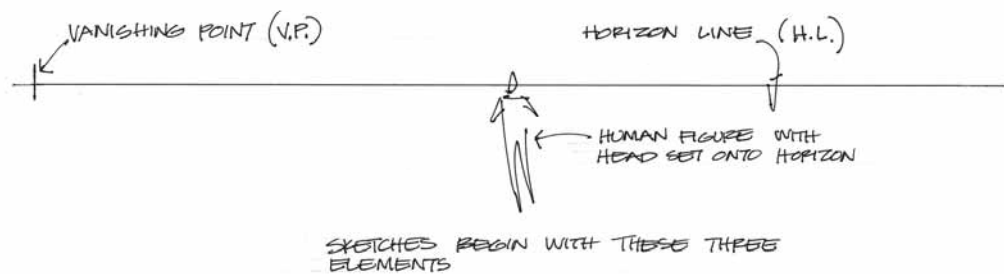
Before you begin drawing, you should remember you are not creating presentation drawings, so remember to work fast, keep it loose and don't get bogged down! The example drawings in this section have been drawn with a straight edge just to make things very clear to you, but it is still all hand drawn.

Start out by drawing a horizontal line; this is the *horizon*. Next, you will sketch a gesture type person (covered in Chapter 2) with the head on the horizon (you will learn more about this later in the *Entourage* section). The size of the person will dictate the overall size of the sketch so try to make it just the right size, which will allow the building to mostly fill the page - not so large it will not fit on the paper or too small that it is hard to show the proper level of detail; the only "right" answer is that this comes with experience.

The next fundamental step to set up your perspective is to locate the *Vanishing Points* (VP) so you can begin projecting lines. Where do you put the *Vanishing Points*? If you are close to the object, the *Vanishing Points* are further apart, and if you are further away the VP's are closer together.

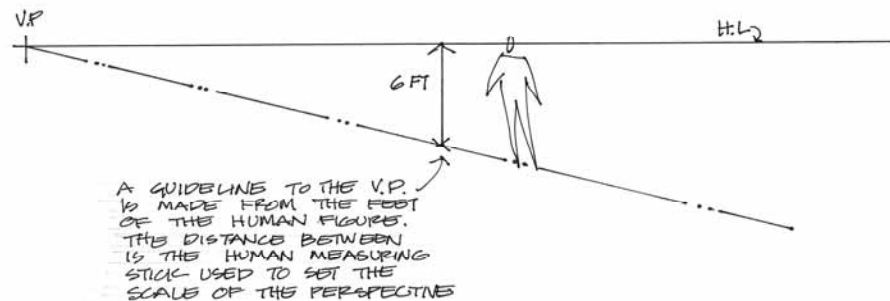
The example directly below shows one *Vanishing Point* on the left, the *Horizon Line* and a person who we will assume is 6'-0" tall. The other *Vanishing Point* will be added later.

Just so you know, even though the horizon actually curves with the surface of the earth, we always draw a horizontal line as the curve is not perceived by the eye. Also, this view would be from another person's perspective – which is why the head is on the horizon. If the view was from an airplane, the head would be well below the *Horizon Line* (if the HL showed up at all).



Step B – project the person back to one vanishing point

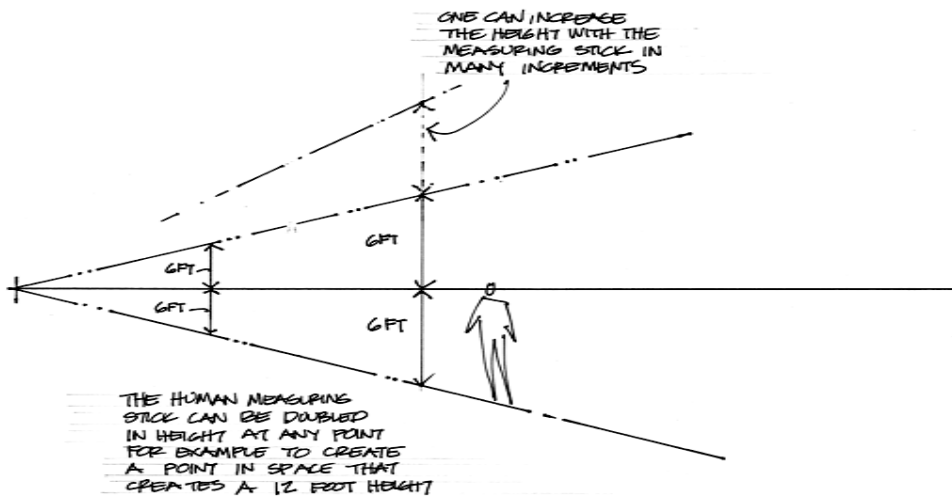
Now that you have the *Horizon Line*, a *Vanishing Point* and a person sketched, you can project a set of lines from the feet and head of your person back to one of the *Vanishing Points*. Obviously the person's feet are on the ground, so the line from the feet to the *Vanishing Point* is also on the ground. From this "grounded" line you can project lines up to start your building. In this example the head is on the *Horizon Line* so you do not really need to project any lines from the head.



Step C – determine the required height

Using the approximate size of your human measuring stick, you can easily sketch additional vanishing lines to establish various heights. Remember, the height stays constant along a vertical line; notice the various 6'-0" tall lines in the image below. For example, imagine the gesture person below with another person standing on his shoulders. This second person's head would (or should) align with the next vanishing line above.

In the next section, after the *Human Scale Method*, you will study how to divide faces and spaces into smaller segments; which will allow more accuracy in your sketch.

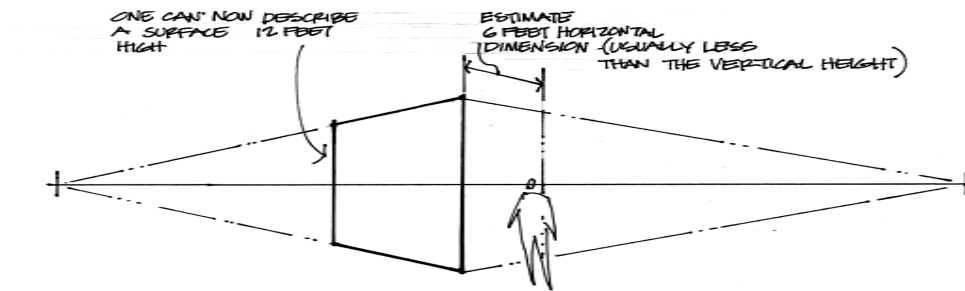


Step D – describing a surface

Now you can draw vertical lines, using the *Vanishing Lines* for reference. Once these vertical lines hit the other *Vanishing Line* (i.e., off the person's head, which is on the HL), you have made a six foot tall line. On one vertical line the scale does not change (like it does in plan) so you can use that 6 foot measure to establish the height of the building (e.g., 2 units = 12' or 3 units = 18').

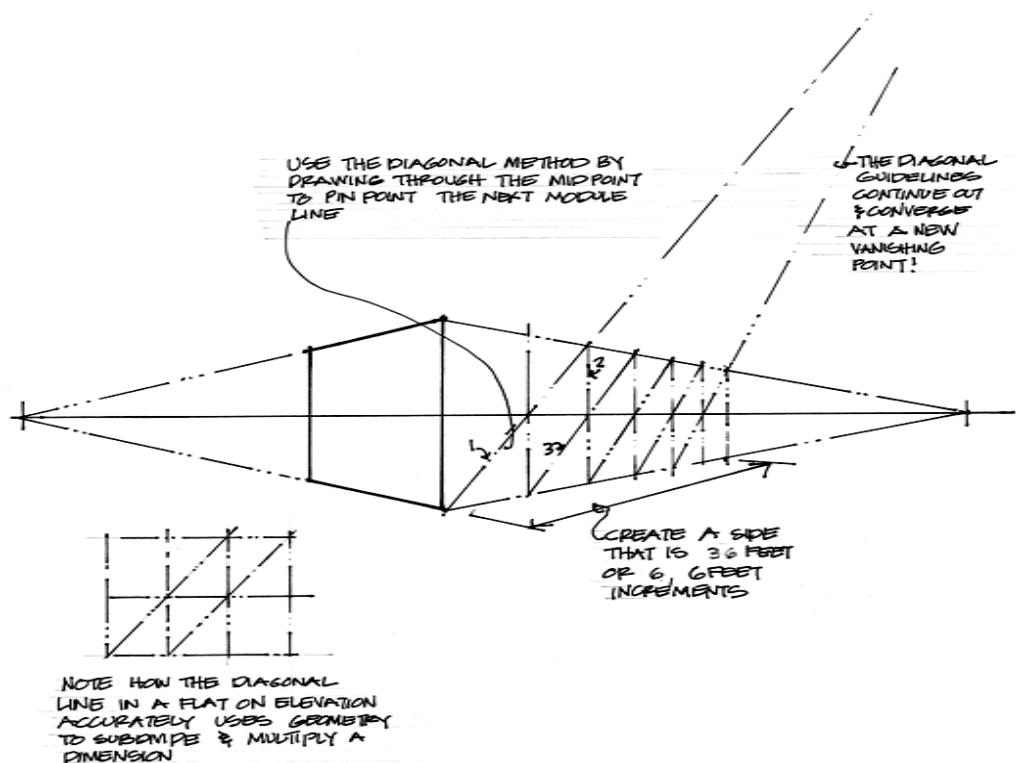
As you can see in the image on the next page, a surface is described by drawing two vertical lines and then “connecting the dots” along the vanishing lines.

In a similar fashion, you can establish another *Vanishing Point* and develop the adjacent surface.



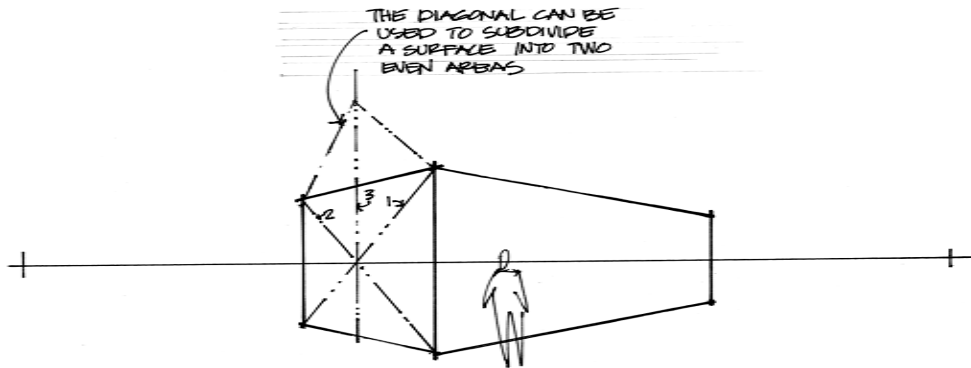
Step E – additional six foot squares

Using the method shown graphically below, you can add additional 6' x 6' surfaces (additional information is provided on Dividing Spaces in the next section). Notice this works in perspective as well as in flat two dimensional drawings (the sketch in the lower left is such a flat drawing).



Step F – gable roof edge

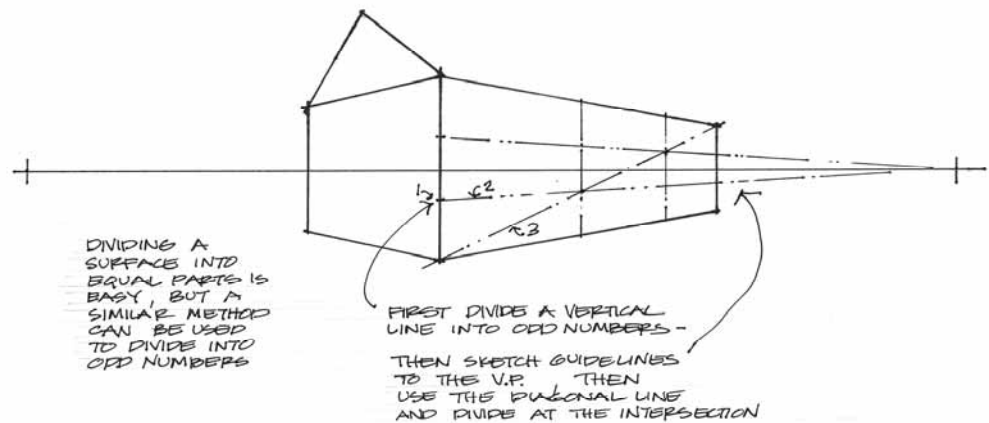
Once you have your primary box established you are now in a position to develop the gable roof edge. As shown (and numbered) below, you can draw an “X” on the surface from corner to corner. Now draw a vertical line which passes through the intersection of the two diagonal lines. Finally you draw the diagonal lines that form the edge of the gable roof.



Step G – dividing a surface into odd numbers

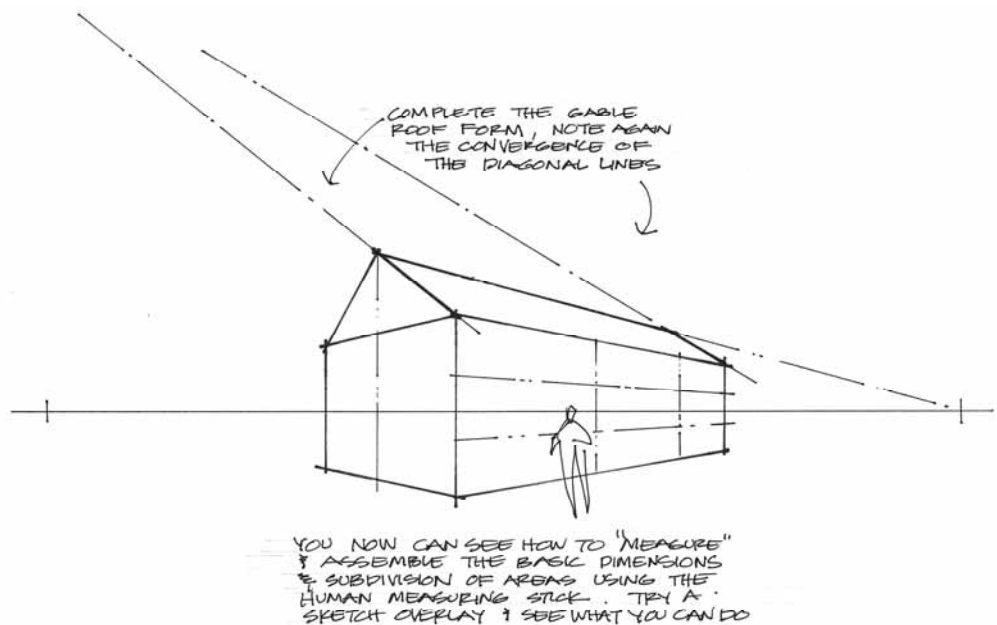
If you already have the overall surface described and you want to add an odd number of vertical lines, then do this:

1. Divide the vertical line into the number of spaces desired. As you should recall, the length is consistent along the length of the vertical lines in a two-point perspective. Therefore you can use a scale if you want to be very accurate or you may eyeball it seeing as things are not distorted. In any case, make a small tick on the vertical lines for reference.
2. Draw lines from the tick marks, made in the previous step, back to the *Vanishing Point*. In the image on the top of the next page there are two ticks, with two corresponding lines extending to the *Vanishing Point*. These lines should be very light on your drawing as they are only for reference.
3. Draw a diagonal line across the surface under consideration. This should also be a rather light line which is only for reference.
4. Sketch vertical lines wherever a vanishing line (drawn in step 2) intersects the diagonal line (drawn in step 3).



Step H – completing the gable roof

Finishing the roof consists, mostly, of connecting the dots. First you sketch a line from the peak of the gable roof (drawn in step F) back to the *Vanishing Point*. The last edge to be defined (the back edge in this example – below) is almost parallel to the front edge; this line is usually approximated.

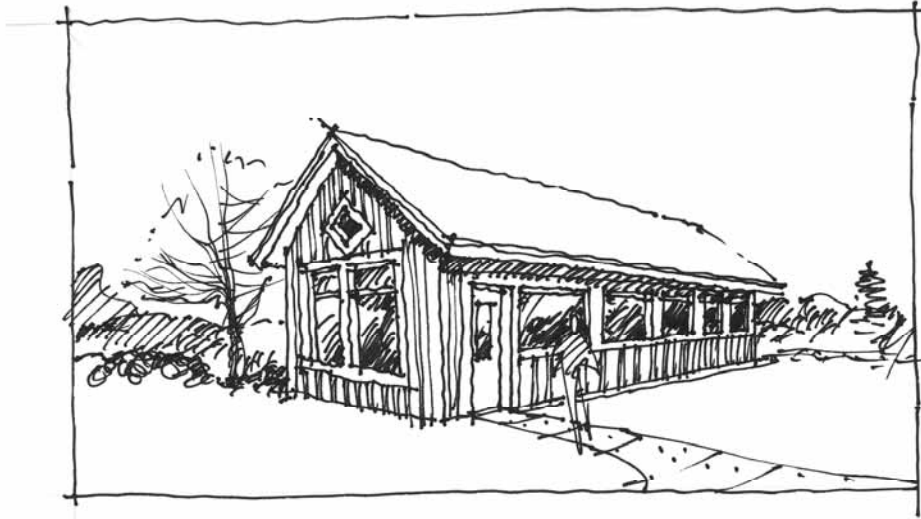


Once you have the *Human Scale* defined on one surface you can project it around the corner and onto other surfaces. To do this you simply project a line from the intersection of the previously draw lines back to the other *Vanishing Point*.

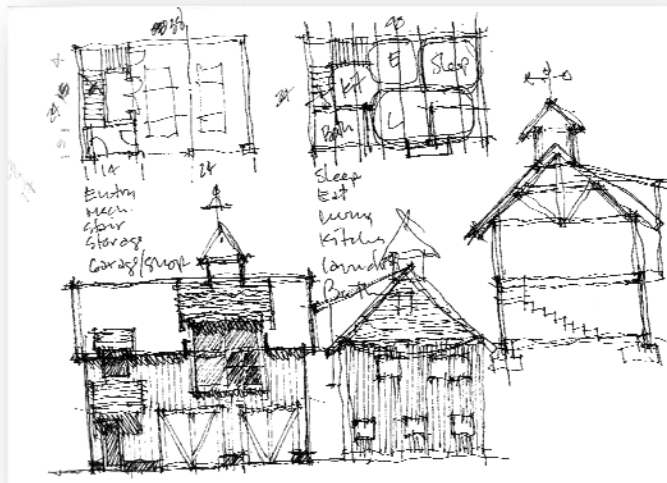
CHAPTERS IN ARCHITECTURAL DRAWING

Finally, you may firm up the major lines. Use a rolling parallel rule to add vertical siding (as shown below) and roofing if the perspective is not too sharp (otherwise the lines are not parallel).

We will cover a little more on this after the next section on *Dividing Spaces*.



The end result is an accurately scaled two-point perspective drawing. You will be presented with several exercises on this method to help drive the concept home!



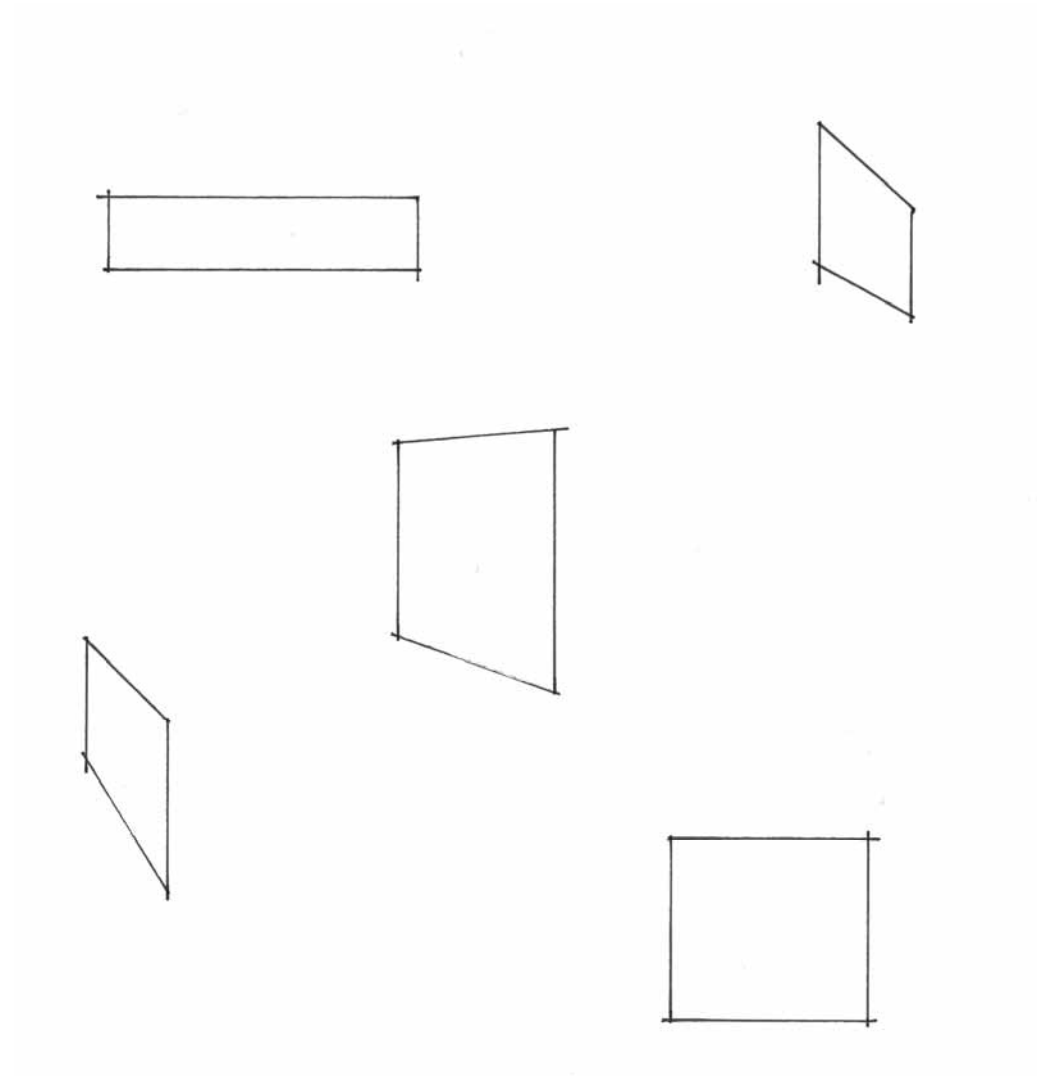
Study Sketches by **Darryl Booker**,
Associate Professor, North Dakota State University

NAME _____ DATE _____

Exercise 8-1

Discover the Horizon Line / Create Boxes from Rectangles

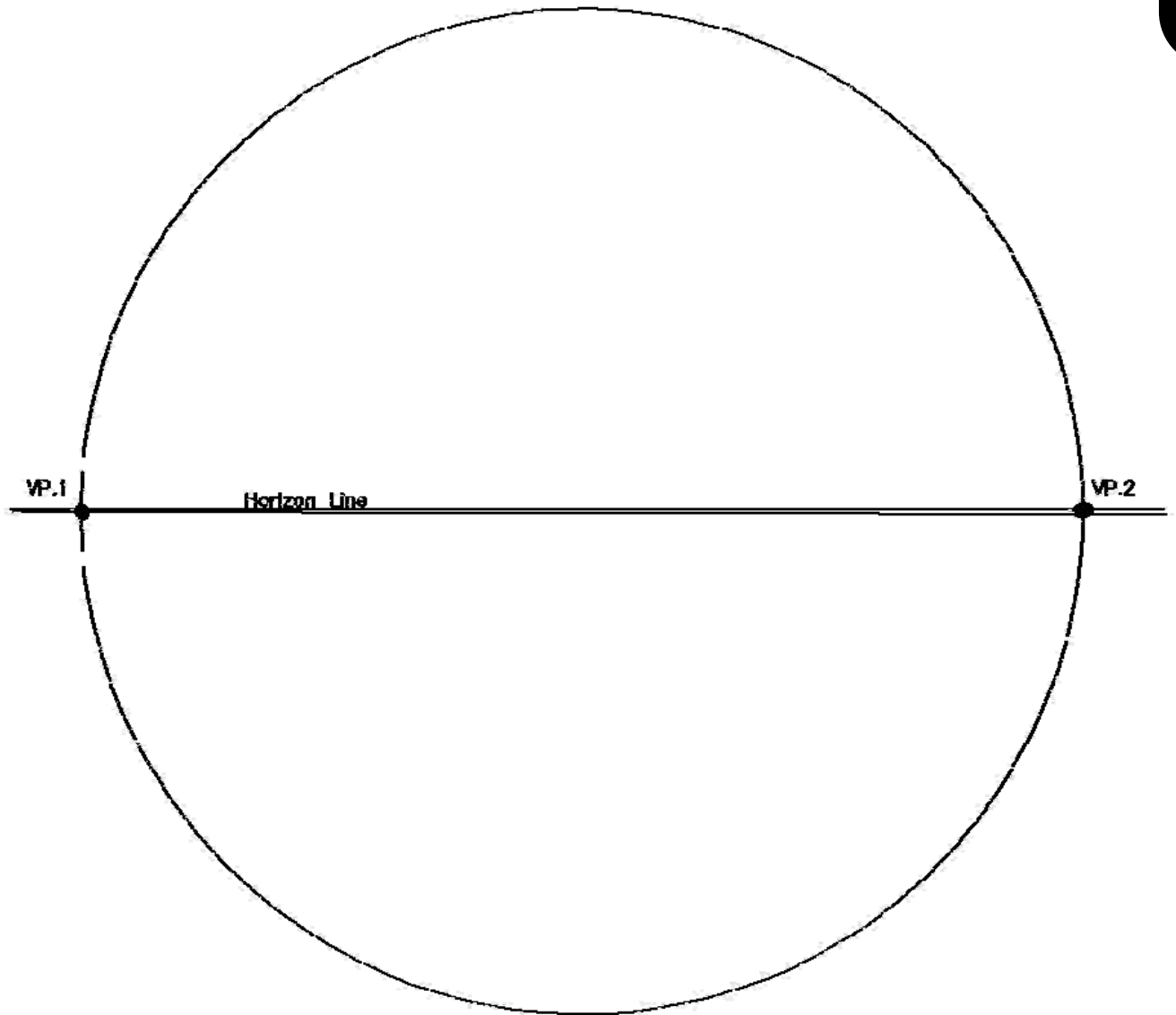
The first task in this exercise is to discover the Horizon Line. This is done by projecting vanishing lines back towards the vanishing point; where the lines converge is where the vanishing point is. You will need to tear this page out and tape it onto a larger piece of paper as the Vanishing Points will not fit on this page. The second task is to turn these surfaces into three-dimensional objects – you decide the depth to show.



NAME _____ DATE _____

Exercise 8-2**Storyboard Exercise – Data**

Make a few copies of this page and try sketching some rectangular shapes similar to those shown at the beginning of Chapter 8. Try to create your own variations on this theme.

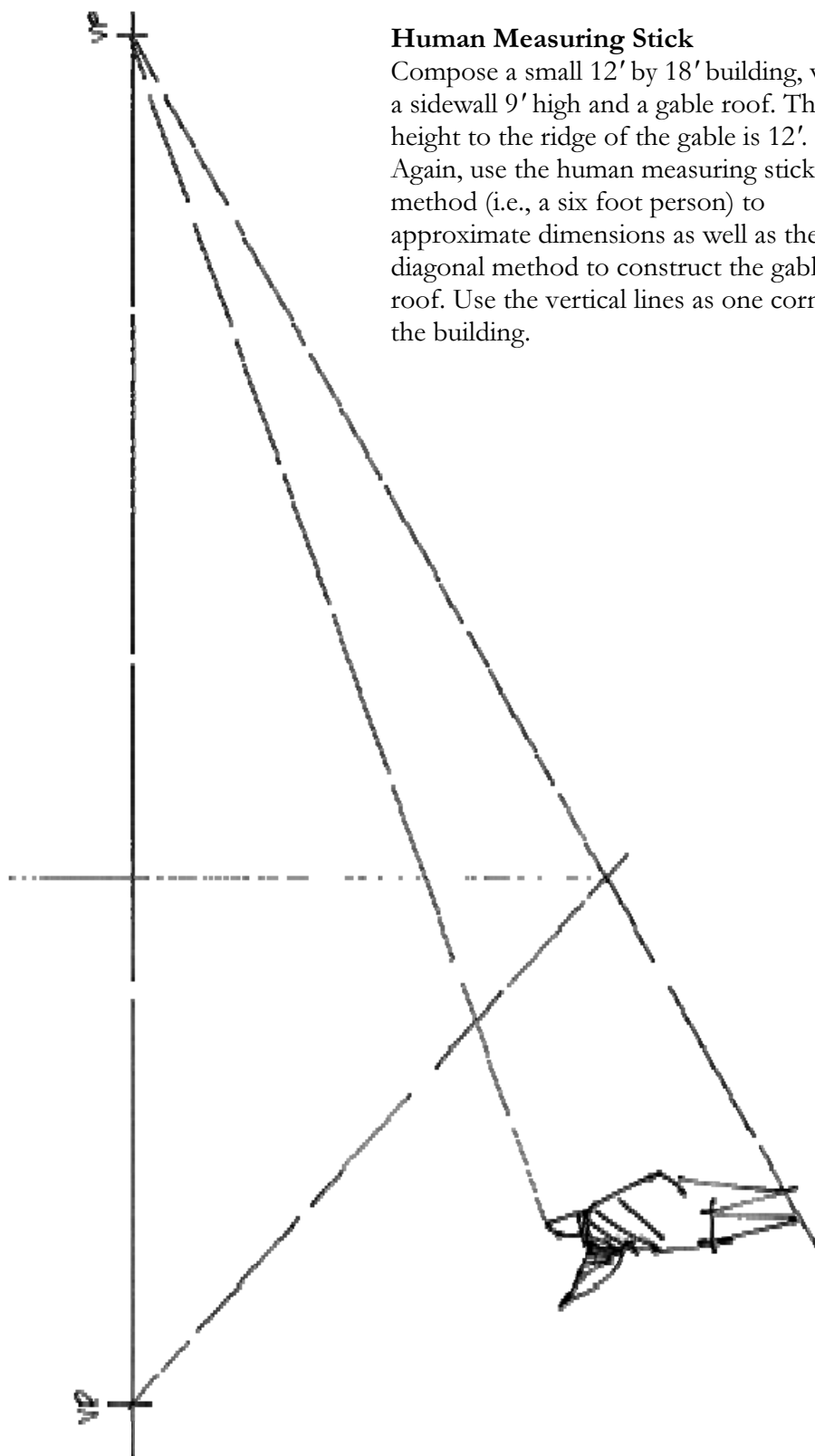


[illegible]

Exercise 8-3

Human Measuring Stick

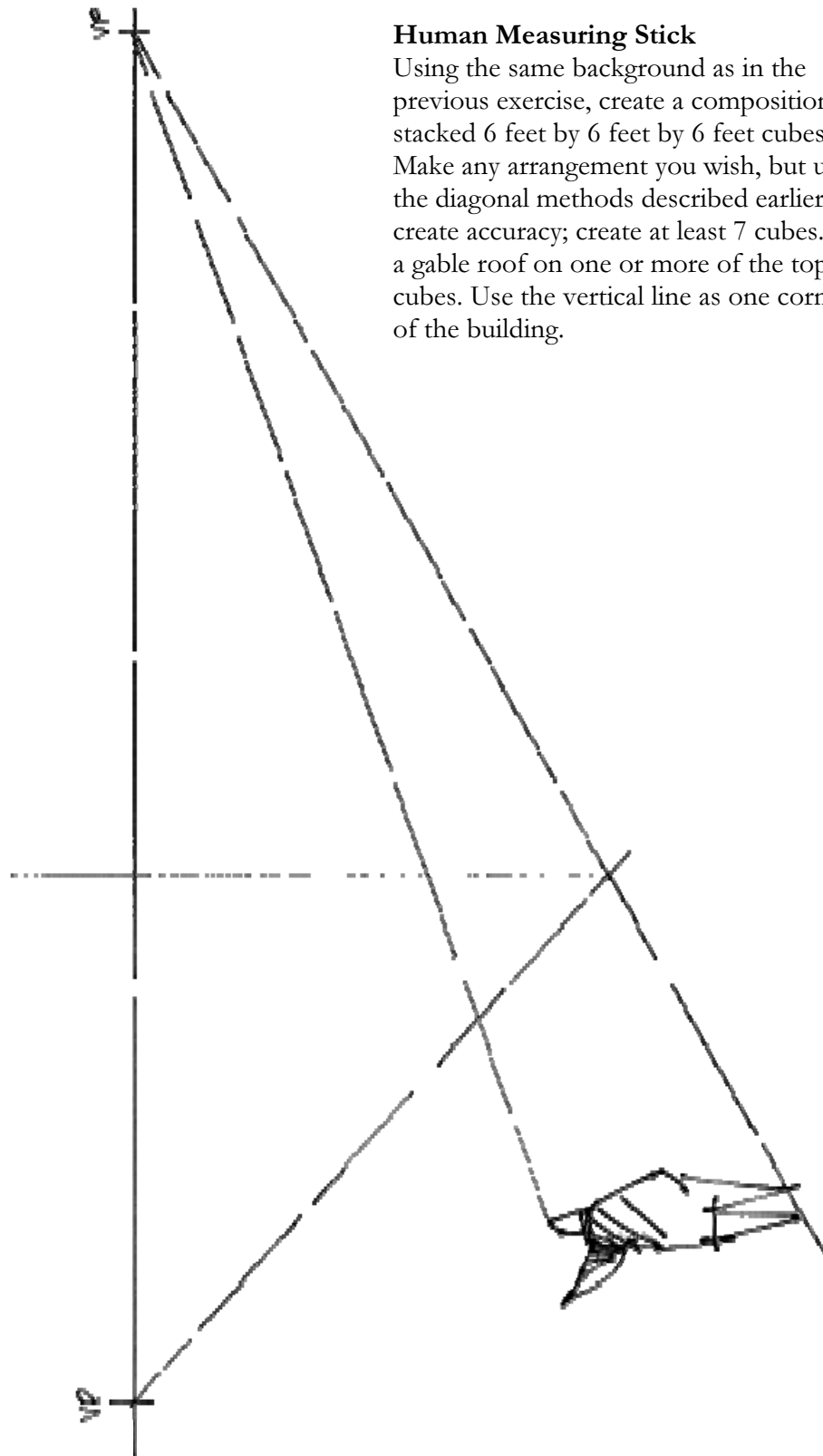
Compose a small 12' by 18' building, with a sidewall 9' high and a gable roof. The height to the ridge of the gable is 12'. Again, use the human measuring stick method (i.e., a six foot person) to approximate dimensions as well as the diagonal method to construct the gable roof. Use the vertical lines as one corner of the building.



NAME _____ DATE _____

Exercise 8-4**Human Measuring Stick**

Using the same background as in the previous exercise, create a composition of stacked 6 feet by 6 feet by 6 feet cubes. Make any arrangement you wish, but use the diagonal methods described earlier to create accuracy; create at least 7 cubes. Put a gable roof on one or more of the top cubes. Use the vertical line as one corner of the building.

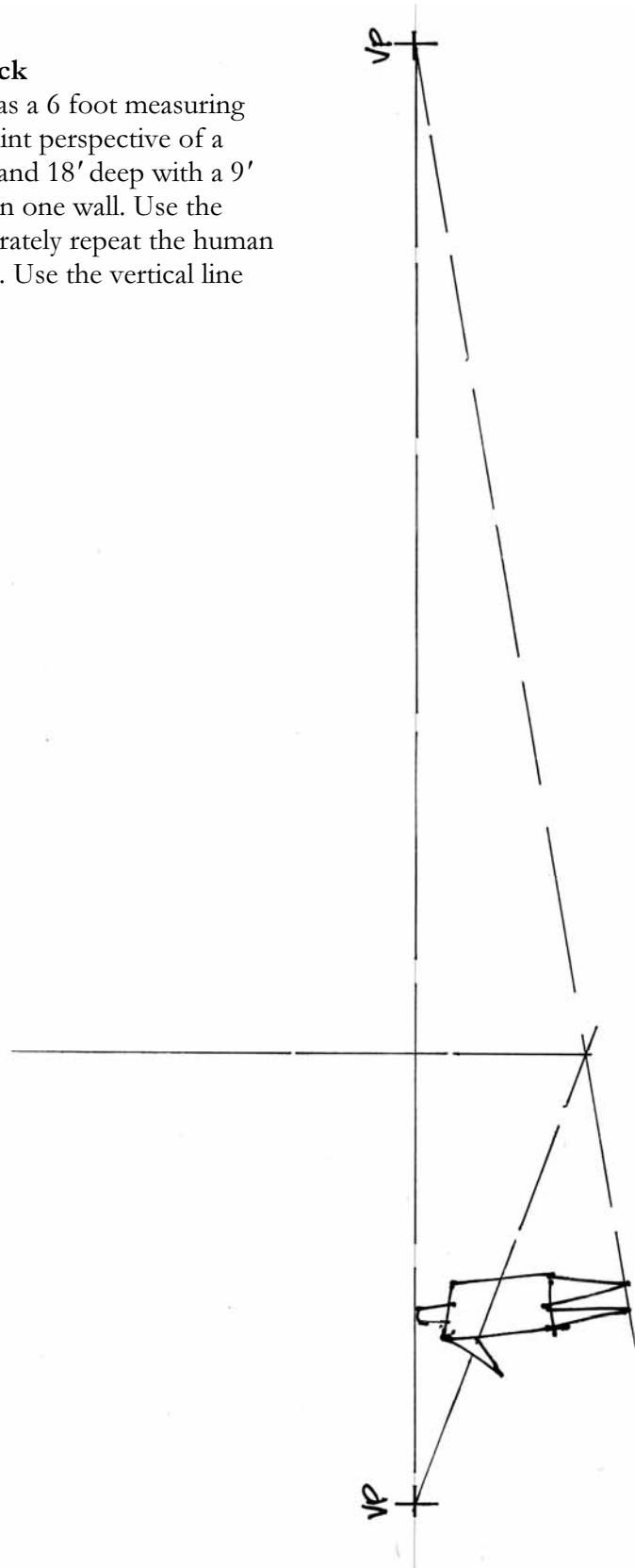


NAME _____

DATE _____

Exercise 8-5**Human Measuring Stick**

Using the human figure as a 6 foot measuring stick, construct a two-point perspective of a block 18' high, 12' wide and 18' deep with a 9' high (and 3' wide) door in one wall. Use the diagonal method to accurately repeat the human measuring stick modules. Use the vertical line provided as one corner.



CHAPTER 8 - THE PERSPECTIVE: TWO-POINT I

NAME _____ DATE _____

Self-Exam:

The following questions can be used as a way to check your knowledge of this lesson. The answers can be found at the lower left on this page.

1. It is not possible to find the *Vanishing Points* in a printed photograph. (T/F)
2. The three types of perspectives are: 1-, 2- and 3-point. (T/F)
3. It is not possible to sketch equal spaces which step back into the perspective view. (T/F)
4. In a 2-point perspective, all lines are either vanishing or _____.
5. _____-point perspectives have both horizontal and vertical lines.

Review Questions:

The following questions may be assigned by your instructor as a way to assess your knowledge of this section. Your instructor has the answers to the review questions.

1. All lines converge in 3-point perspectives. (T/F)
2. In the *Human Scale* method, the [human's] head is aligned with the *Horizon Line* for eye-level drawings. (T/F)
3. Rectangular shapes are sketched more easily than are organic shapes with the 2-point perspective method. (T/F)
4. In a photograph, one does not usually see the horizon line. (T/F)
5. In a 2-point perspective, the two vanishing points are not always on the *Horizon Line*. (T/F)
6. The main value in the _____ method is making the various parts of the drawing the proper size.
7. Sketching an "X" on a surface in perspective locates the center. (T/F)
8. 3-point perspectives have vertical line work in them. (T/F)
9. It is possible to reveal the *Horizon Line* in a photograph. (T/F)
10. In a 2-point perspective, the length is consistent along any given vertical line. (T/F)

Self-Exam Answers:
1 - F, 2 - T, 3 - F, 4 - Vertical, 5 - One