The University of Jordan
School of Engineering
Department of Architecture Engineering

Visual Communication (I)

Course Manual

Fall 2024

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Drawing Tools

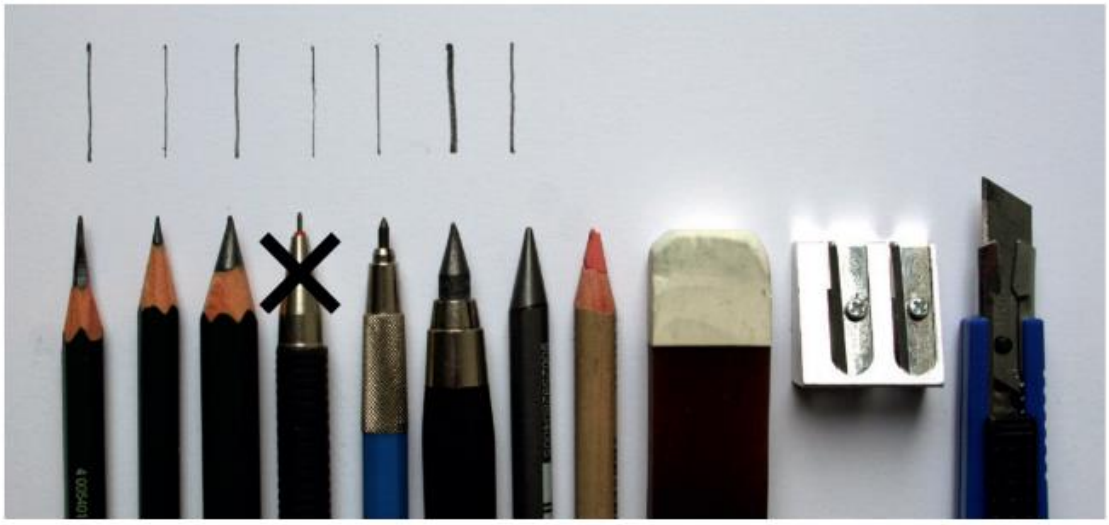
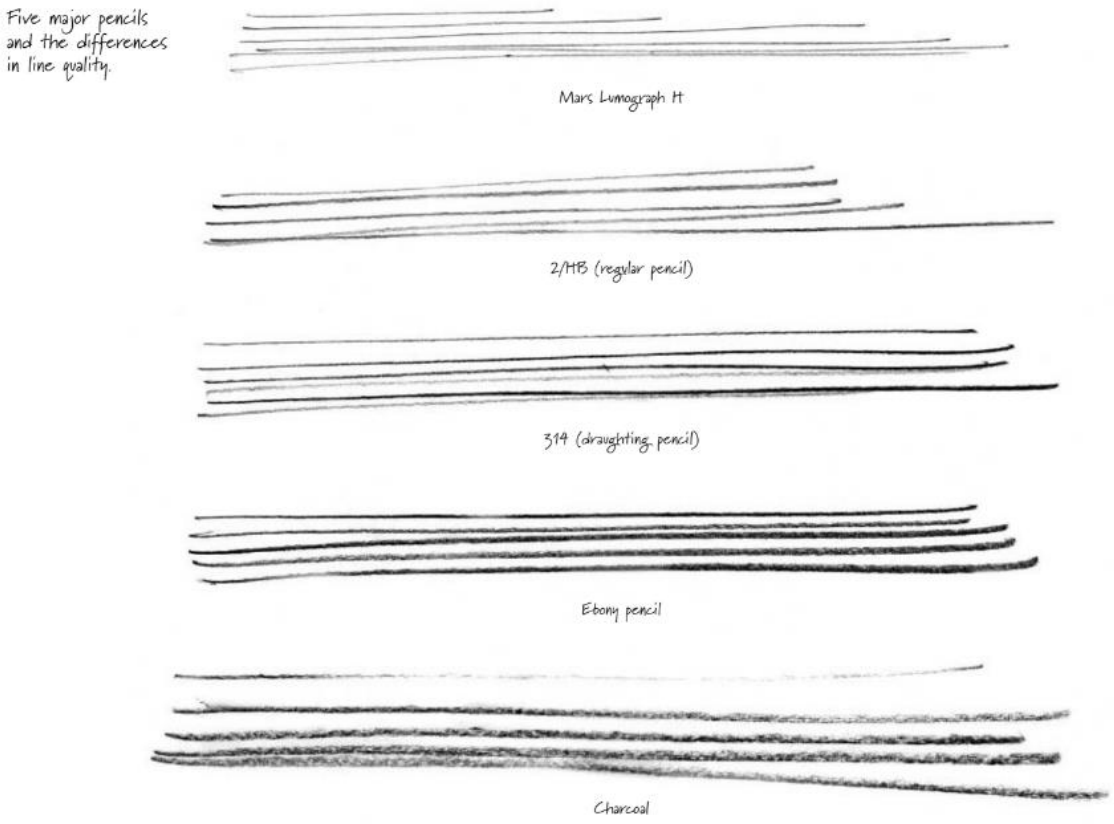


Fig. 20: Pencils, clutch pencils, graphite stick, eraser, sharpener and cutting knife



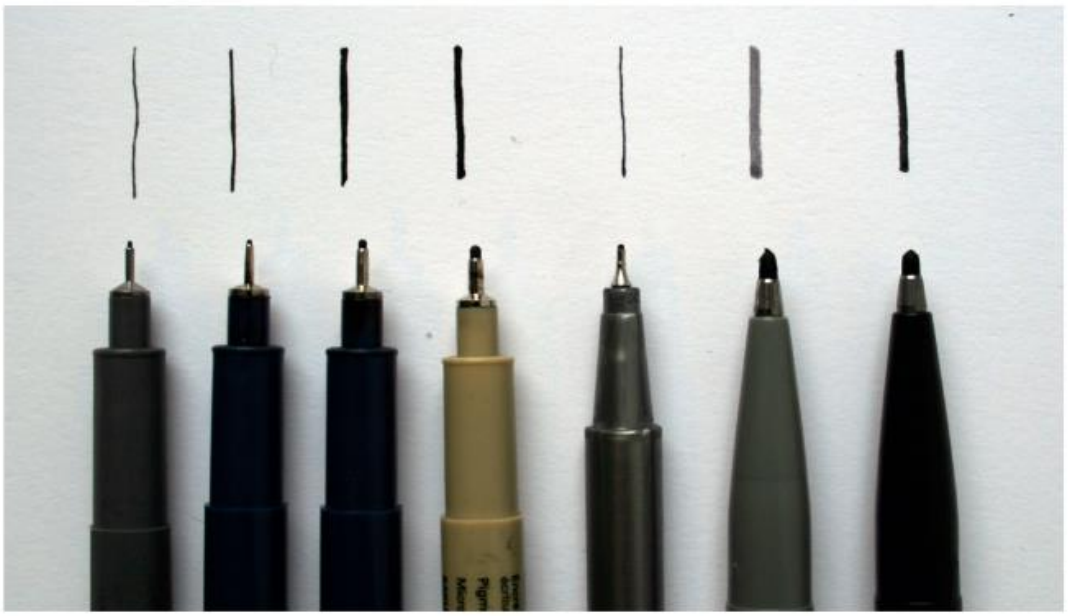
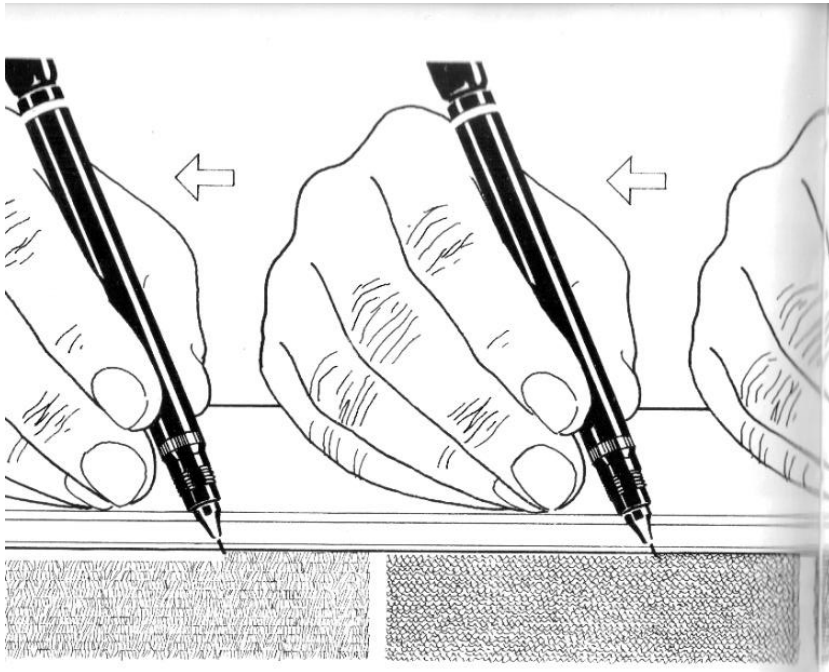
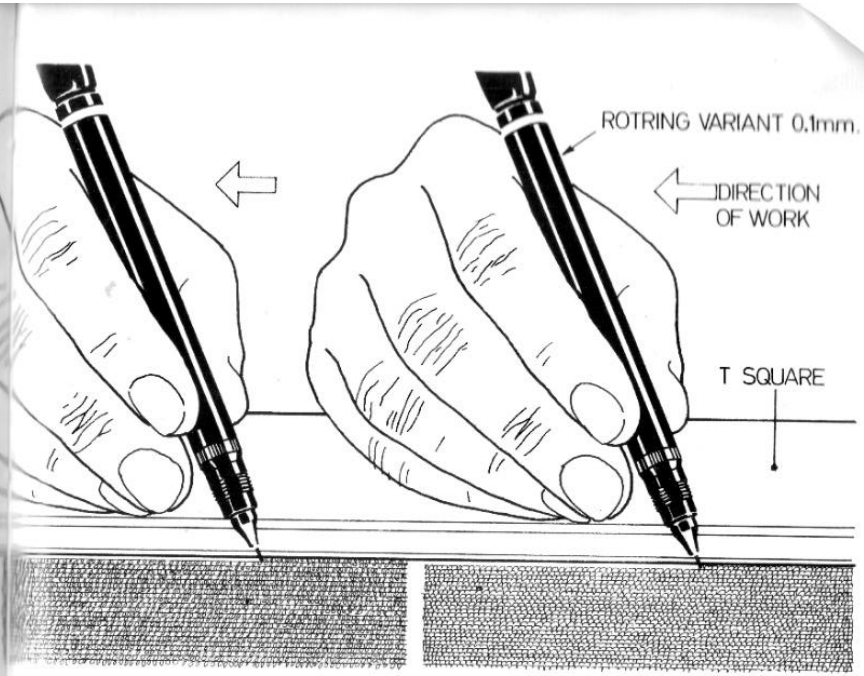
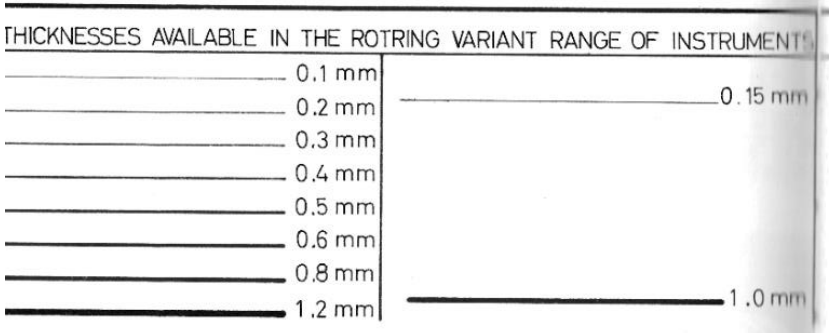
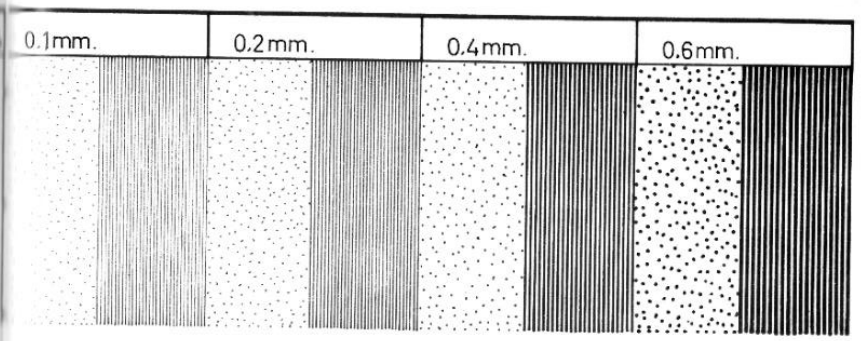


Fig. 24: Ink pens with different line widths and felt-tip pens









. 86 The method used to v various textures, using a

Holding Techniques

TECHNIQUES 3

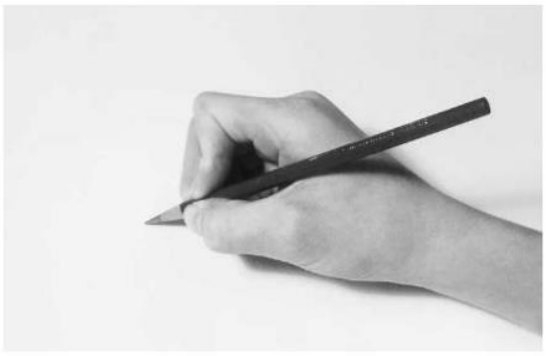
Control the pencil with three fingers.

The grip should be relaxed but firm. Control the movement with the same three fingers.

Holding the Pencil

There are many ways to hold the pencil but the key word to remember when sketching is "relax." Avoid holding the pencil as if you were writing because the writing grip is rather firm and tight. The sketching grip is comparatively looser and easier. Hold the pencil approximately two to three inches from the tip of the lead. The grip position should involve the thumb and the first two fingers only, with the pencil resting comfortably on the inside of the tip of the third finger. Use the second finger and the thumb to stabilize the pencil and to prevent it from slipping out.

The relationship between the second finger and the thumb usually dictates the type of lines and sketching style. When the tips of the two are relatively close together, anchoring the pencil, the entire hand generally folds inward; and thus the mobility and reach of the pencil movement is limited by how far the fingers can stretch. This position is called Position A and is quite similar to the writing grip. It is very useful in sketching short strokes and details, and it gives the artist more control of the tool while it is less prone to making mistakes.



WRITING POSITION

- tight grip
- no flexibility
- hold very close to lead

SKETCHING POSITIONS

- looser grip
- flexible
- hold farther up the shaft

POSITION A

POSITION B

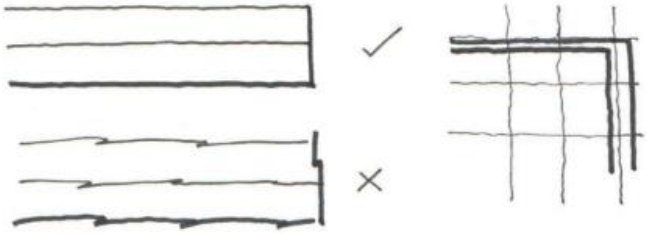
Position B is when the tips of the second finger and thumb are far apart. The second and third fingers are usually straight instead of being curled inward, increasing the mobility and reach of the pencil. By sweeping up and down with the extended second and third fingers, the strokes can reach six to seven inches. This is an ideal position for shading because the grip is loose and the fingers are much easier to move. This position also allows the artist to hold the pencil sideways and maximizes the effectiveness of the entire pencil tip. Broad strokes are one result of this grip. Simply extend the fingers of the entire hand with the palm down and glide the pencil across the page. The angle of the pencil must be adjusted to the individual artist's hand and degree of flexibility. One should be able to switch from Position A to Position B in a continuous movement without hesitation or stoppage.

POSITION C

The third position (Position C) involves holding the pencil as if holding a putty knife or small hand tool. The pencil is held between the thumb and the second finger. This eliminates any form of finger or hand movement and is therefore mainly suited for long and broad strokes. The entire forearm is used, giving the artist maximum reach. Depending on the size of paper available and the reach of the artist's arm, pencil strokes can reach over three feet. This position can also be used to create chisel strokes. Just hold the pencil and strike it up and down using short and abrupt strokes.

Florian Afflerbach, 2014, Basics Freehand Drawing, Birkhäuser

Drawing Lines



3. How to draw lines

- Draw lines in a positive controlled single stroke
- Ends must meet (best) or slightly overlap
- Draw lines in draft feint, and go over heavy later
- Section cuts use heavier lines
- Elements in background use lighter lines

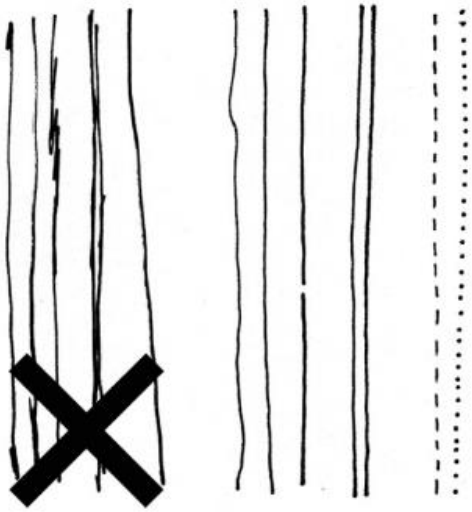


Fig. 16: Incorrectly and correctly drawn lines, full lines, dashed lines and dotted lines

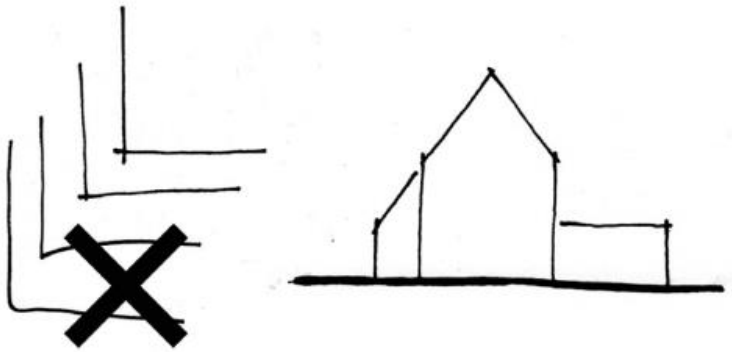


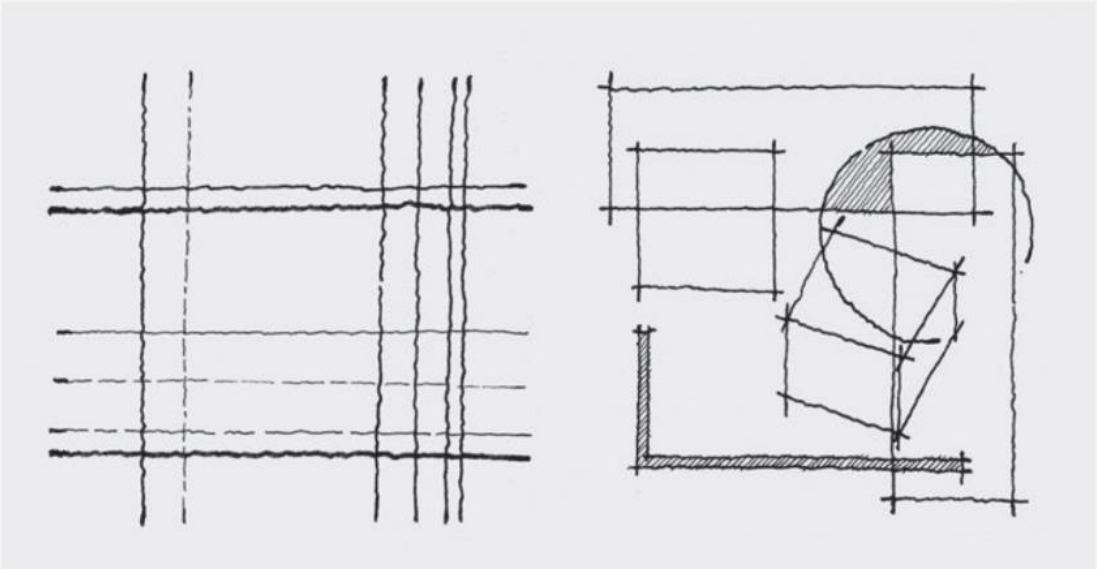
Fig. 17: Correct and incorrect corners, the lines of the building volumes in the background are separated somewhat from the main volume.

Drawing the Lines

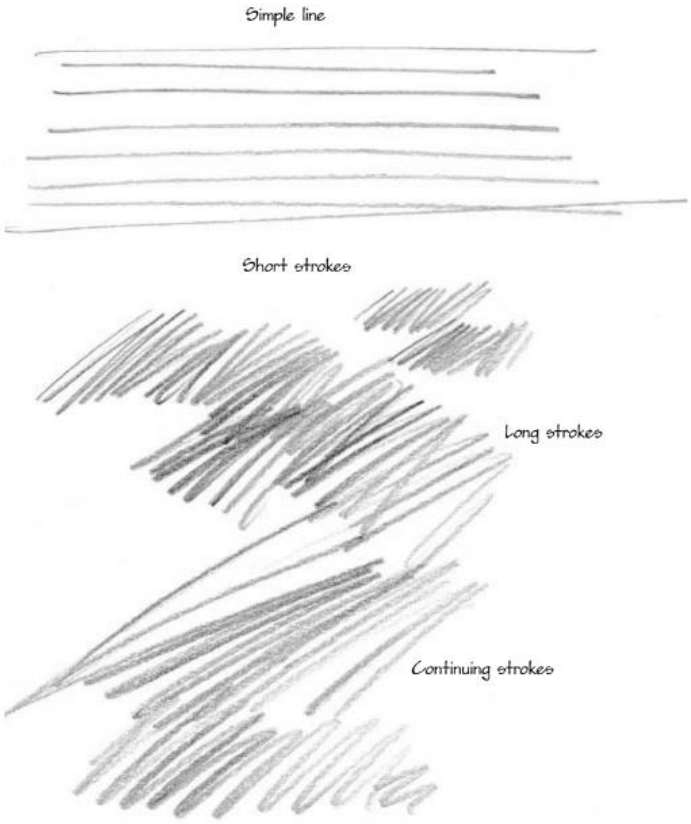
Draw a straight line by not drawing a straight line. To draw a straight line, it is helpful to think of riding a bicycle. When children first learn to ride a bicycle, their arms swing the handlebars back and forth as they compensate and adjust their balance. At first, the wheel turns wildly back and forth in order to move in a straight line without tipping over. Slowly after much practice, the back and forth motion diminishes and, seemingly, stops. Yet, when you think about it, the constant back and forth adjustments continue if imperceptibly. Imagine for a moment to lock your arms and the handlebar so that the wheel does not turn. You know that in a few seconds, the bike and yourself would be on the ground. Even professional bicyclists move their handlebars back and forth like a child. You just can't see it. Likewise, when drawing a line, it is helpful to maintain a straight line by wiggling or vibrating the line. Such a line is more of a high-pitched vibration akin to a vibrating mobile phone or an electric toothbrush. This has two results. First, by vibrating the line adjusts so that it can move straight. If it veers too much in one direction, you can adjust it in the other direction. Secondly, a vibrating line gives the optical illusion that the line is straighter than it appears.

Move your pencil and hand, not your whole arm. When drawing, draw like you write. Rest your hand on the page and draw lines that are the extent of your hand's movement. When you want a longer line, pick up and plant your hand farther down the line and begin again.

Guidelines, massing lines, contour lines and surface lines. Develop your drawing by first only using guidelines. These guidelines are light lines that mark out the overall drawing. When the overall form is established, then add different line types and weights. Likewise, begin to develop a line vocabulary of different line types using varied pencils, pens or other media. Let the lines develop from light to dark, tapering, dashed, dotted, etc. Let the lines begin to help map, shape and form.



Eric J. Jenkins, 2013 Drawn to Design Analyzing Architecture Through Freehand Drawing, Birkhäuser, Germany



Lines and Strokes

Line refers to a long and continuous thread with a consistent width, while strokes are comparatively short and broken lines in a variety of widths. Line is the residual mark left on the paper as a result of a pencil gliding across it. It is graceful and fluid in nature. Strokes, on the other hand, are strike marks and they are often bold and deliberate.

In sketching, line is used to define spatial edges and describe objects. A variety of widths can be achieved by simply adjusting the angle of the lead. In theory, a hard lead produces a thin and light line, while a soft lead produces a dark and thick line. However, a good quality, soft sketching pencil is equally capable of producing a wide range of lines by itself. It is quite unnecessary to stock yourself with an array of leads because one or two simple pencils will do all the tricks.

In sketching, it is always a good idea to try to use a variety of line widths to avoid a monotonous look. For example, a profile line (a thicker line width) is used to visually lift the object from the background and to make the object look more three-dimensional. Different line widths within a sketch give the sketch a better sense of depth and space. This is especially evident when sketching landscape.

Lettering

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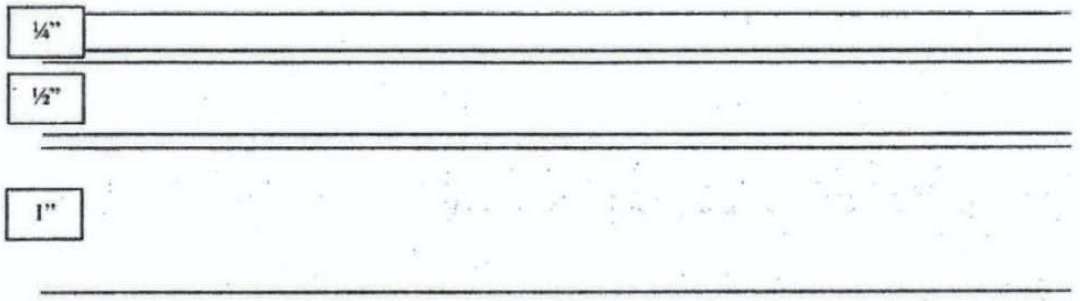

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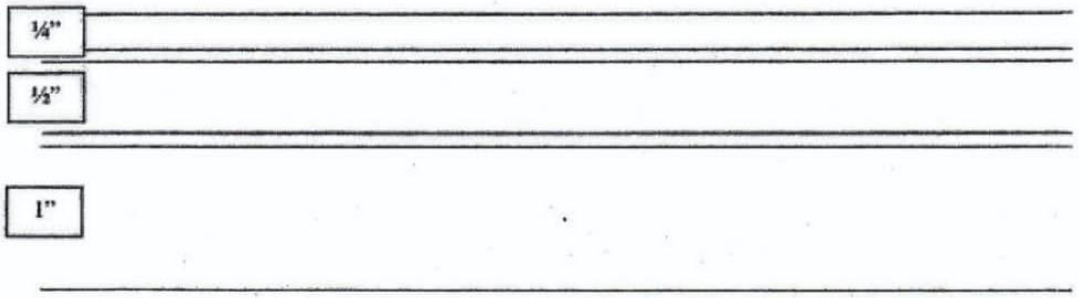

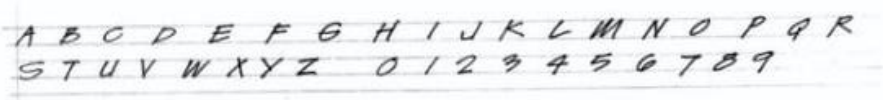
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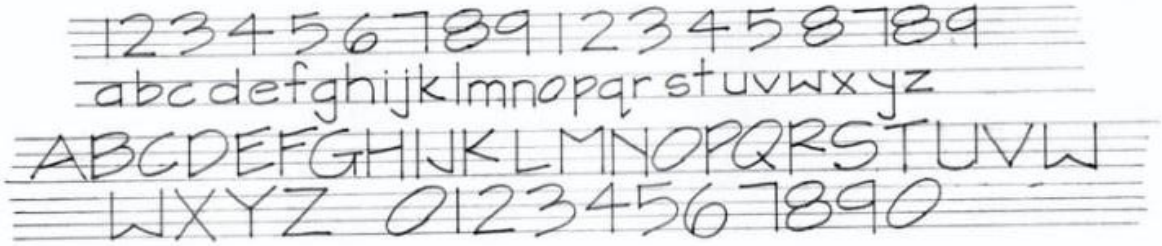
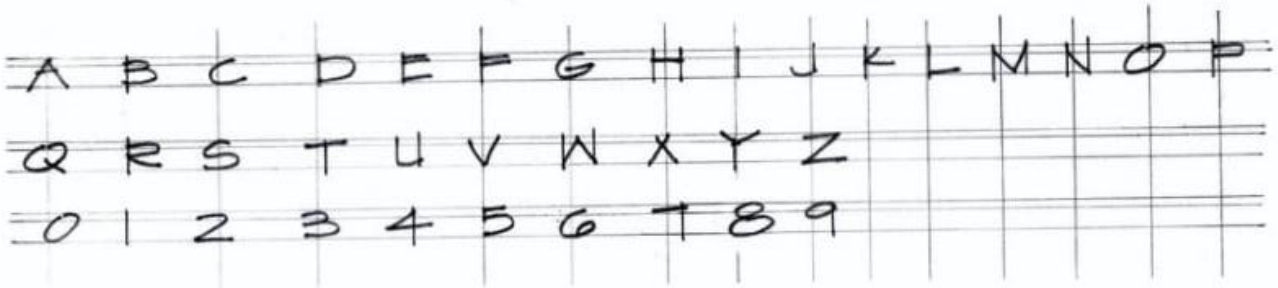

1 2 3 4 5 6 7 8 9 1 2 3 4 5 8 7 8 9
a b c d e f g h i j k l m n o p q r s t u v w x y z
A B C D E F G H I J K L M N O P Q R S T U V W
W X Y Z 0 1 2 3 4 5 6 7 8 9 0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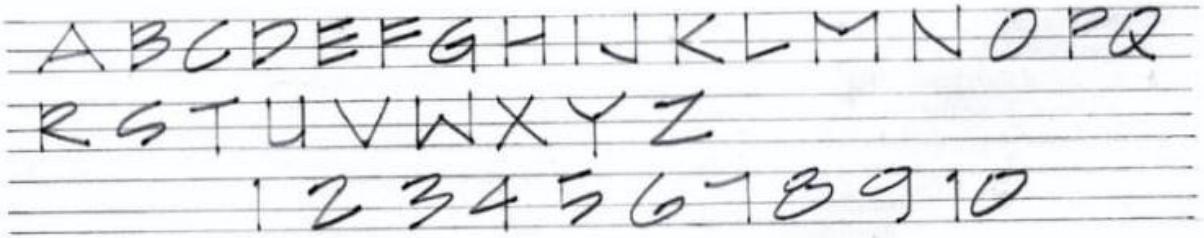
Q R S T U V W X Y Z
0 1 2 3 4 5 6 7 8 9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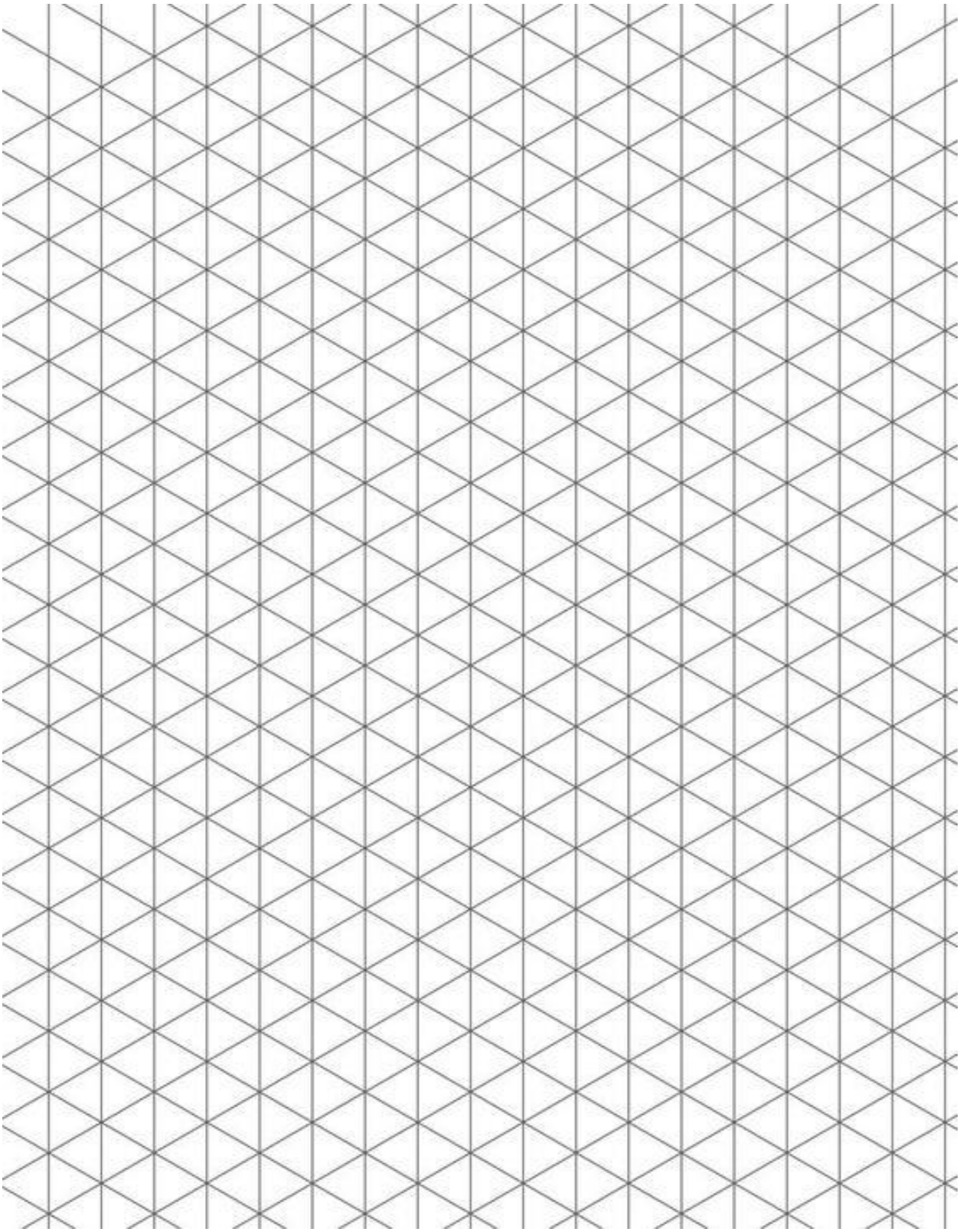
R S T U V W X Y Z
1 2 3 4 5 6 7 8 9 10

Hatching



Hatching

Hatching allows us to create surfaces, shadows or to indicate materials with the use of lines. It should not be confused with the different kinds of hatching used to denote specific materials in technical drawings. Essentially, we distinguish between angled hatching, cross-hatching and dotted hatching.

Diagonal hatching, whether simple or crosshatched, is intended to emphasise the flatness of a building part or to indicate that part of a building lies in shadow. Then the lines of the hatching run in the direction of the light source. If simple hatching is made vertically or horizontally this can also indicate the material to be used. > Fig. 21, page 28 It is also possible to make hatching denser at an edge or corner as a way of depicting curvature. ■

■ **Tip:** Hatching ought not to be drawn too rapidly. Snaking thin lines, irregular distances between the lines or changes in direction give an impression of carelessness. The individual lines of the hatching should be drawn right up to the borders of the area to which the hatching is applied. This calls for patience and precision but it is the only way to achieve the desired effect, the depiction of a flat area.

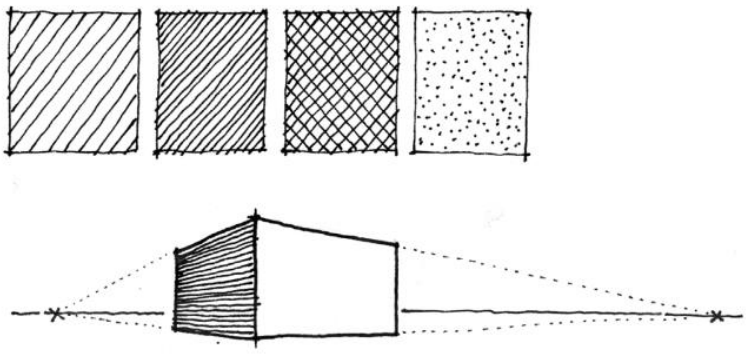
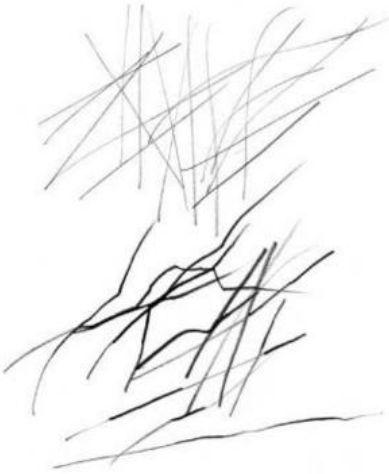
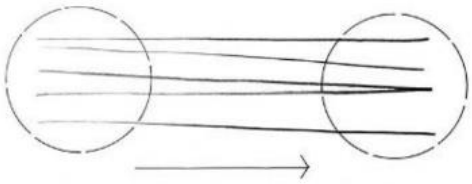


Fig. 18: Different kinds of hatching, in the perspective the hatching lines recede towards a vanishing point



Simple lines with no pressure applied to the pencil; associated mostly with hard pencil.



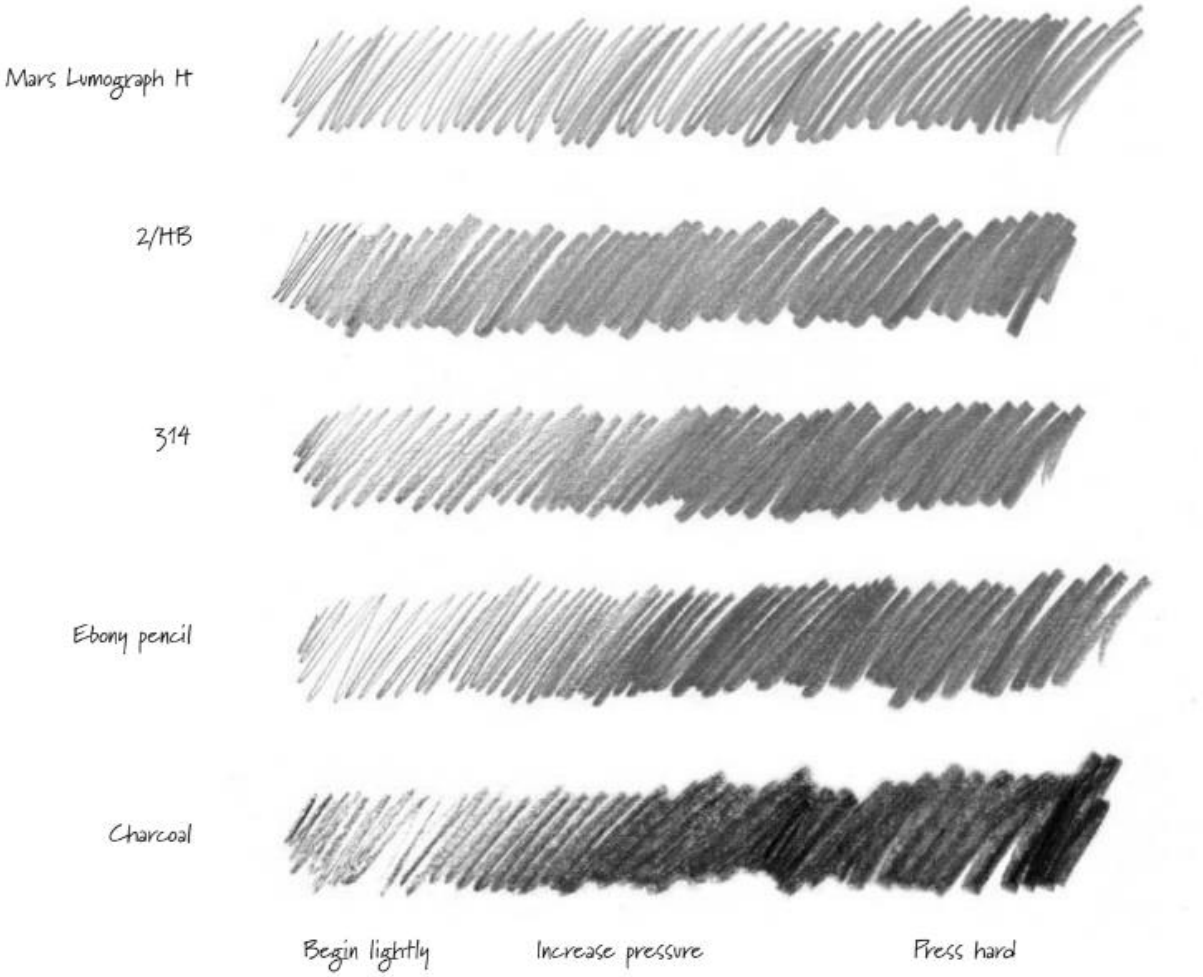
Lines which show signs of pressure and the twist and turn of the pencil; the trademark of using a soft pencil.

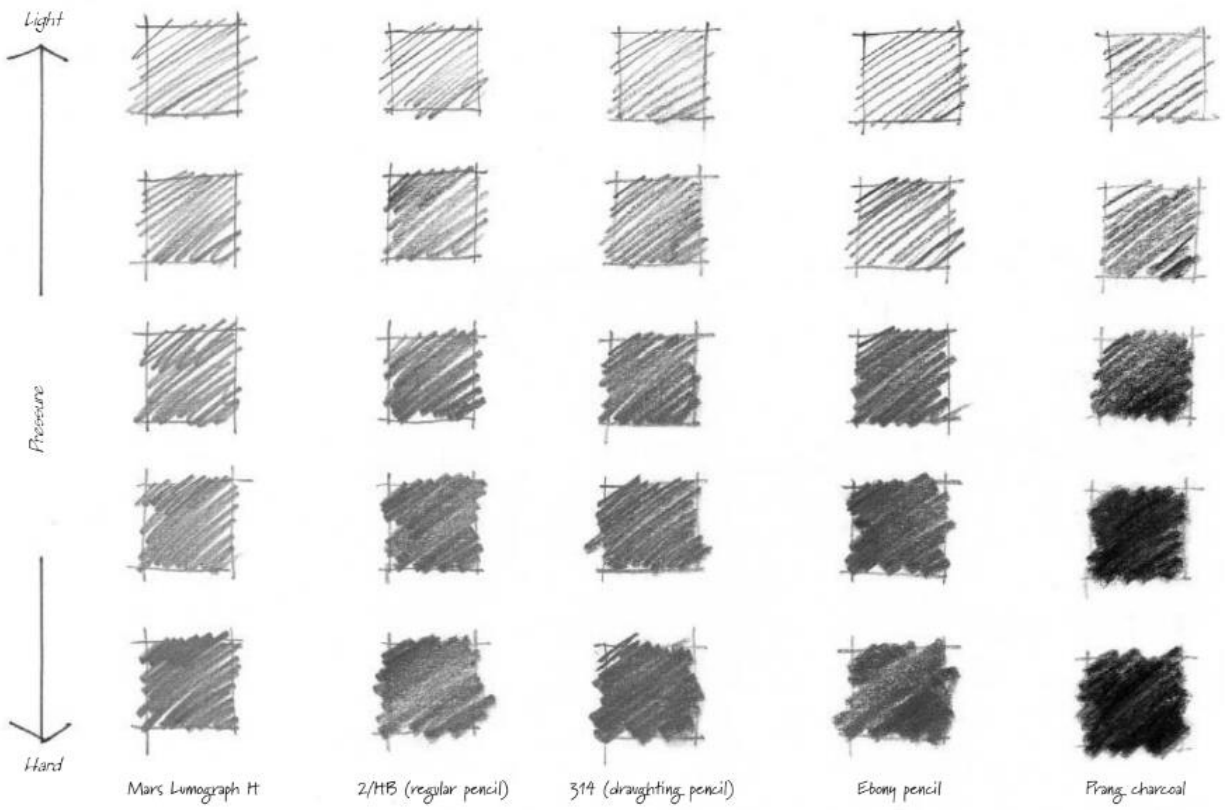
Pressure

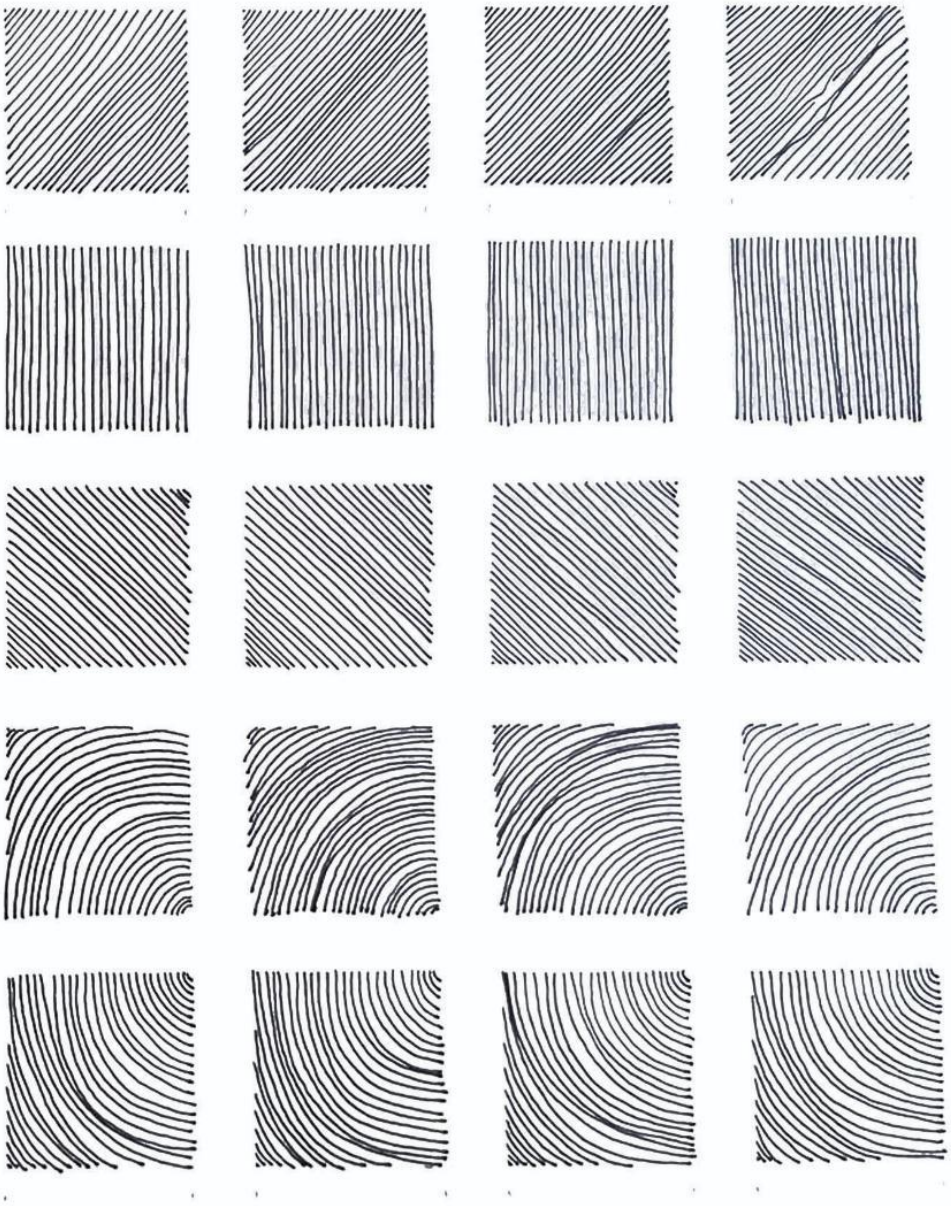
Applying pressure (force) to the pencil is what gives grace and liveliness to a line. Without pressure, the strokes and lines are plain and boring. A simple line drawing in pen and ink can be quite beautiful when there is a consistency in the lines, as this kind of uniformity can bring out the clarity and lightness of the sketch. A pencil is not a pen, however, and a pencil line should not strive for consistency. A hard lead can provide a line that is relatively consistent when compared with a softer lead. But the beauty of pencil sketching lies in the artist's ability to apply pressure to the pencil in order to alter the quality of the lines. The striking, lifting and rotating, the occasional nudging and twisting, and the sudden change of the angle of the lead all contribute to a multitude of effects which are unique to pencil sketching. And it is this uniqueness that makes pencil special.

A pencil should and must be treated as an extension of the artist's hand, arm, and fingers. After all, it is only through this kind of intimate joining that a sketch can be produced. The mechanics of sketching involve not just the motion of a hand holding a pencil, but the entire sensory relay from eyes to brain to hand, and so forth. We observe and examine with our eyes; simplify with our brain and eyes; reason with our brain about what should be kept; record with our hand; evaluate with our eyes again to see if the image looks at all like the one we saw earlier; make instant changes and reevaluate everything again in a perpetual cycle. This is the sketching process in a nutshell. And just as sketching is undoubtedly a mental process that is very personal and intimate, so too is the act of applying pressure to the pencil a personal and intimate experience. There is no scientific standard for how much force one should exert on a certain lead. It is basically a trial-and-error process because you learn from your mistakes and successes. You do it repeatedly to achieve a consistent pattern and you try to keep it that way, but no one can teach you how to do it. Finding the right force

STROKE AND PRESSURE




Light
Pressure
Hard
Mars Lumograph H
2/HB (regular pencil)
314 (draughting pencil)
Ebony pencil
Prang charcoal



BASIC TEXTURES

A

Short individual strokes; change direction occasionally to create a cross-hatching effect.

B

Short, continuous strokes; change direction occasionally.

C

Continuous M-strokes; change direction constantly.

D

Continuous W-strokes; change direction constantly.

E

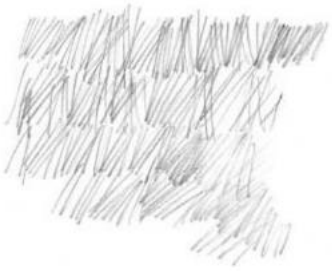
Very short M-strokes with constant direction.

PRACTICE STROKES (A)

Begin with small finger movement; increase pressure on pencil; expand movement to include moving of the hand; use the wrist.

2/HB pencil

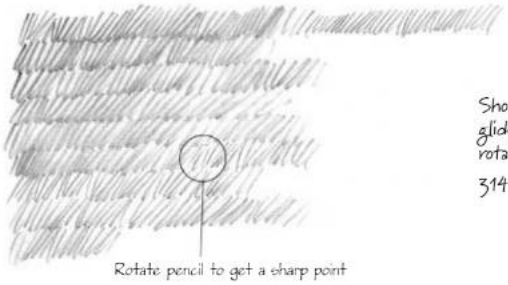
PRACTICE STROKES (B)



Focus primarily on finger movement; adjust angle of hand accordingly.

2/HB pencil

PRACTICE STROKES (C)



Short up/down strokes using finger movement; glide the hand across the page to repeat stroke; rotate pencil.

314 pencil

33

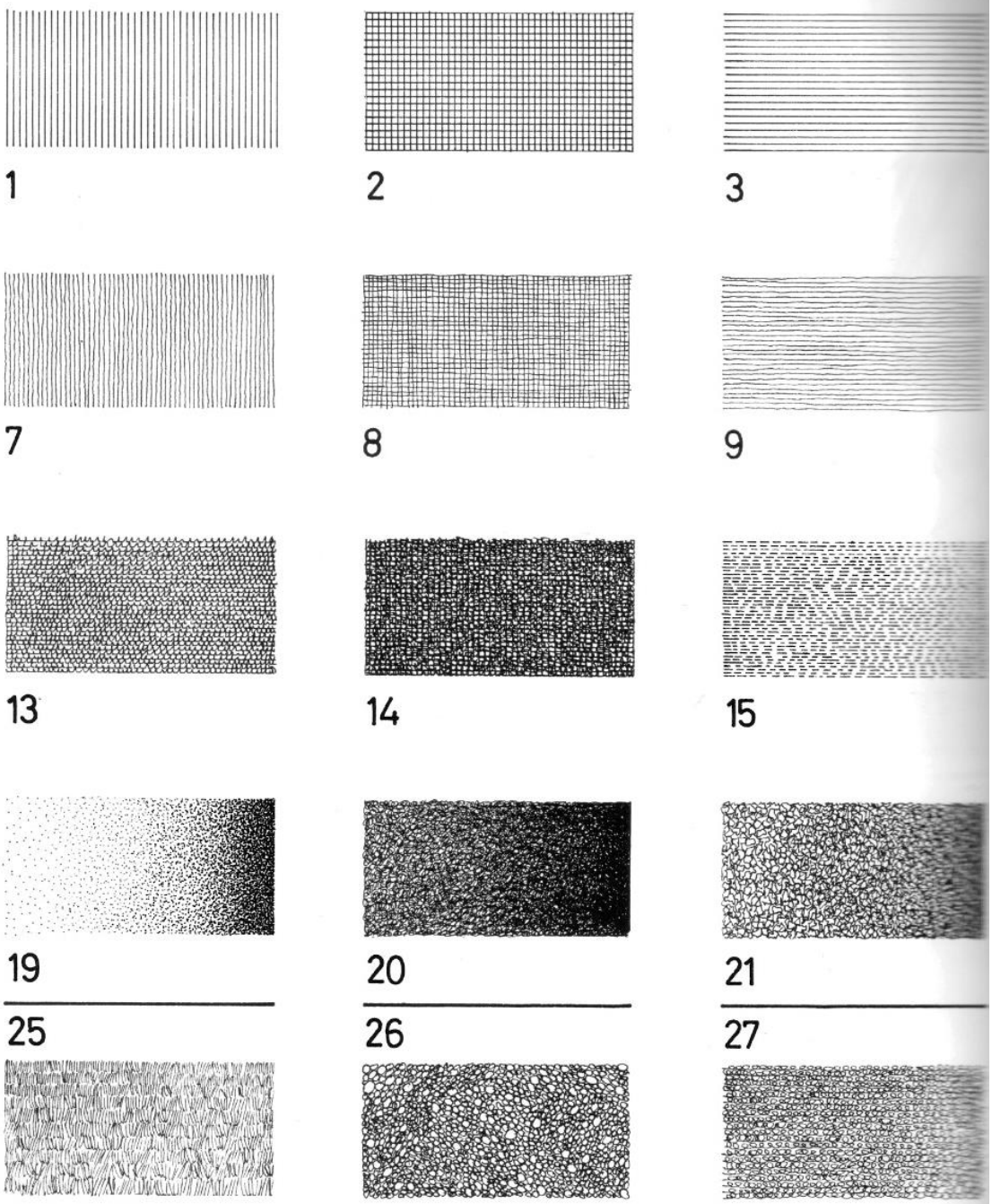
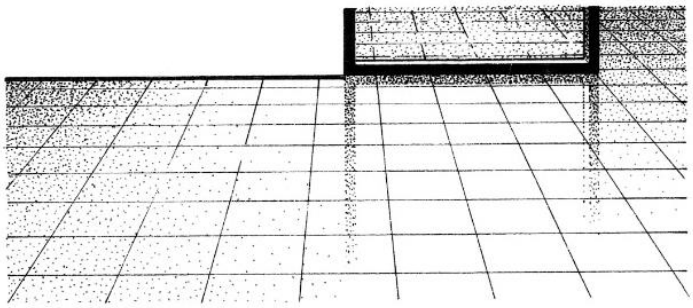


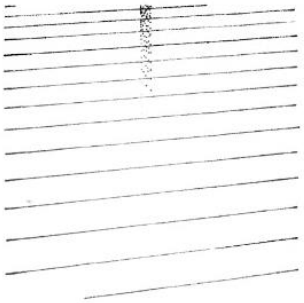
Fig. 87 Thirty different textures which can be achieved using an 0.1-mm line thickness.

Examples 1–6 are drawn using a T-square and/or set square. Examples 7–12 are drawn freehand. Examples 13–18 are drawn using a T-square and/or a set square. Examples 19–28 are drawn freehand, and 29 and 30 are ruled, showing how shading can be achieved by using different spacing of lines. These are by no means all the textures which can be produced, as combinations and variations of those shown will produce endless possibilities.



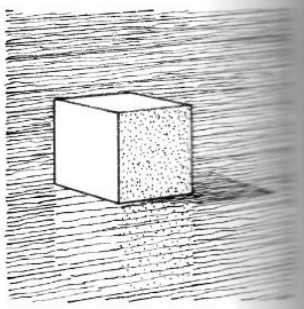
LINO OR VINYL TILES

1
CARPET



1
TIMBER FLOORS

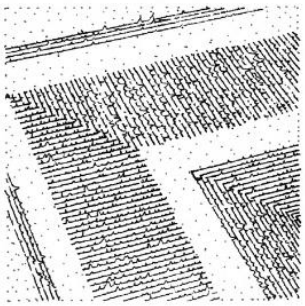
2



1
SHADOW CAST

FLOOR RUGS

1



2

3.

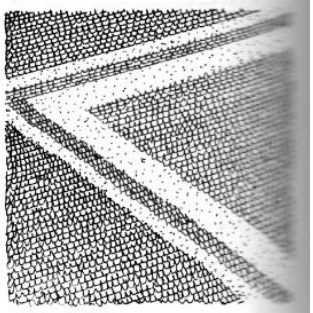
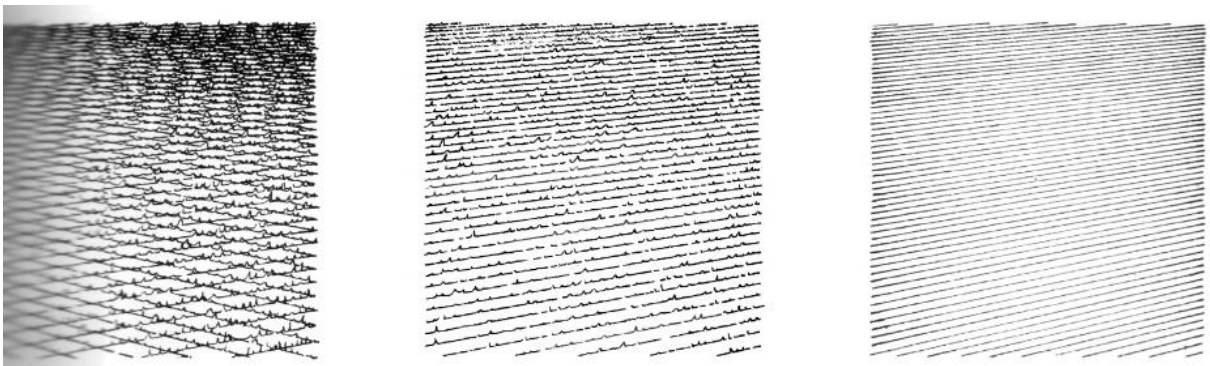


Fig. 89 Techniques for various types of floor finishes.

These include shadows and reflections in some cases and, as is the case with many of these diagrams, little more need be said because most can be learnt from studying the drawings.



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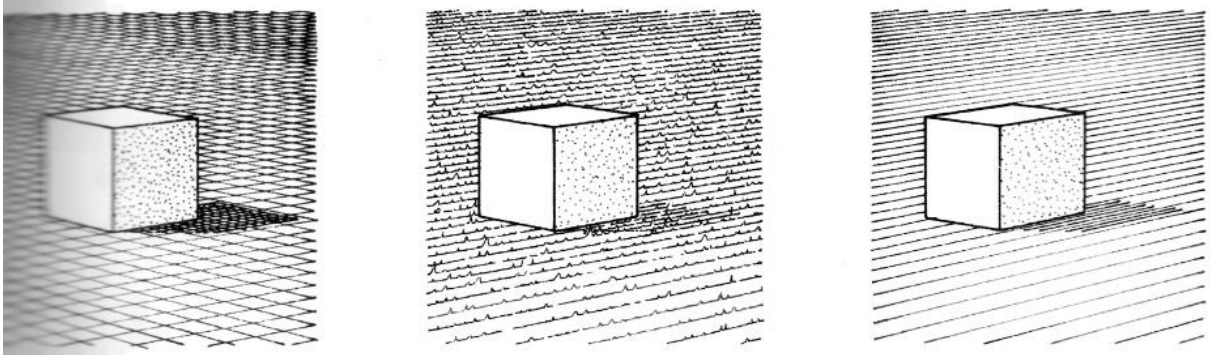
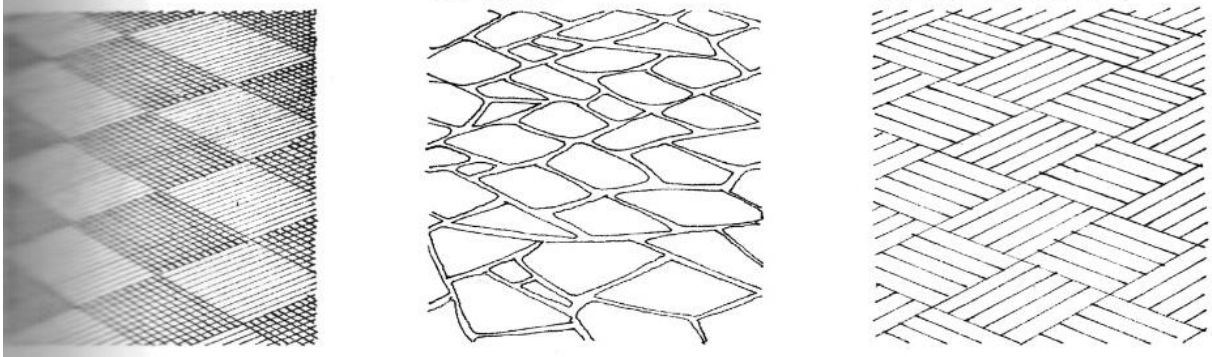


2

3

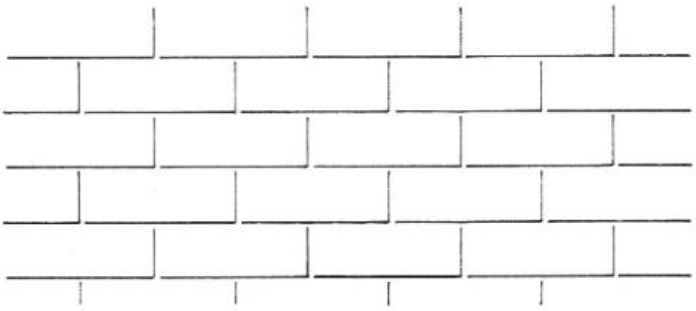
4

SIMPLE OBJECT ON VARIOUS FLOOR FINISHES.

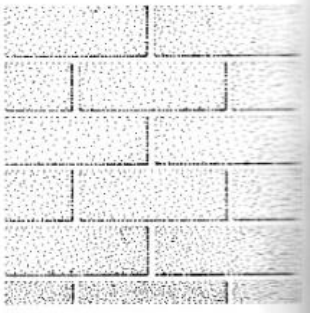


STONE

WOODBLOCK

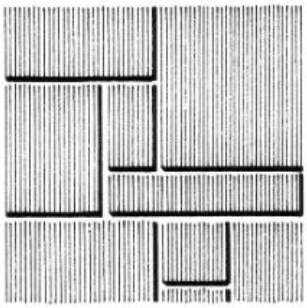


1
BRICKWORK



2

1
STONEWORK



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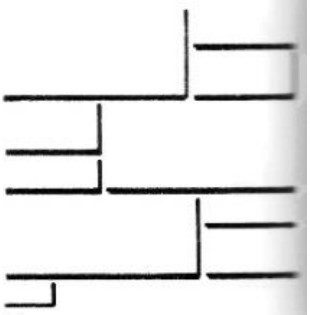
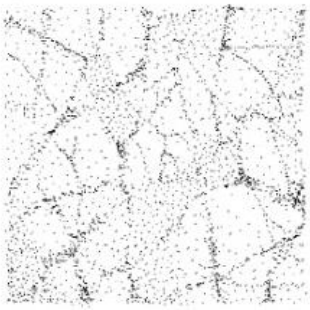


3

MARBLE
1



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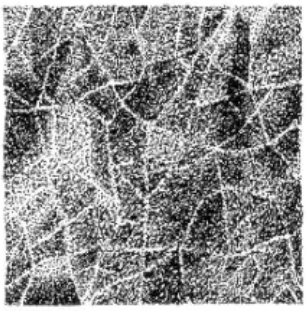


PLASTER

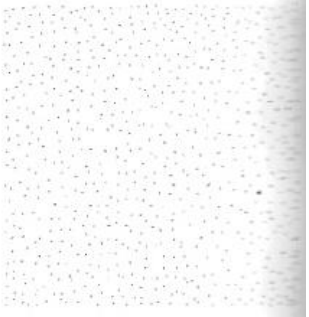
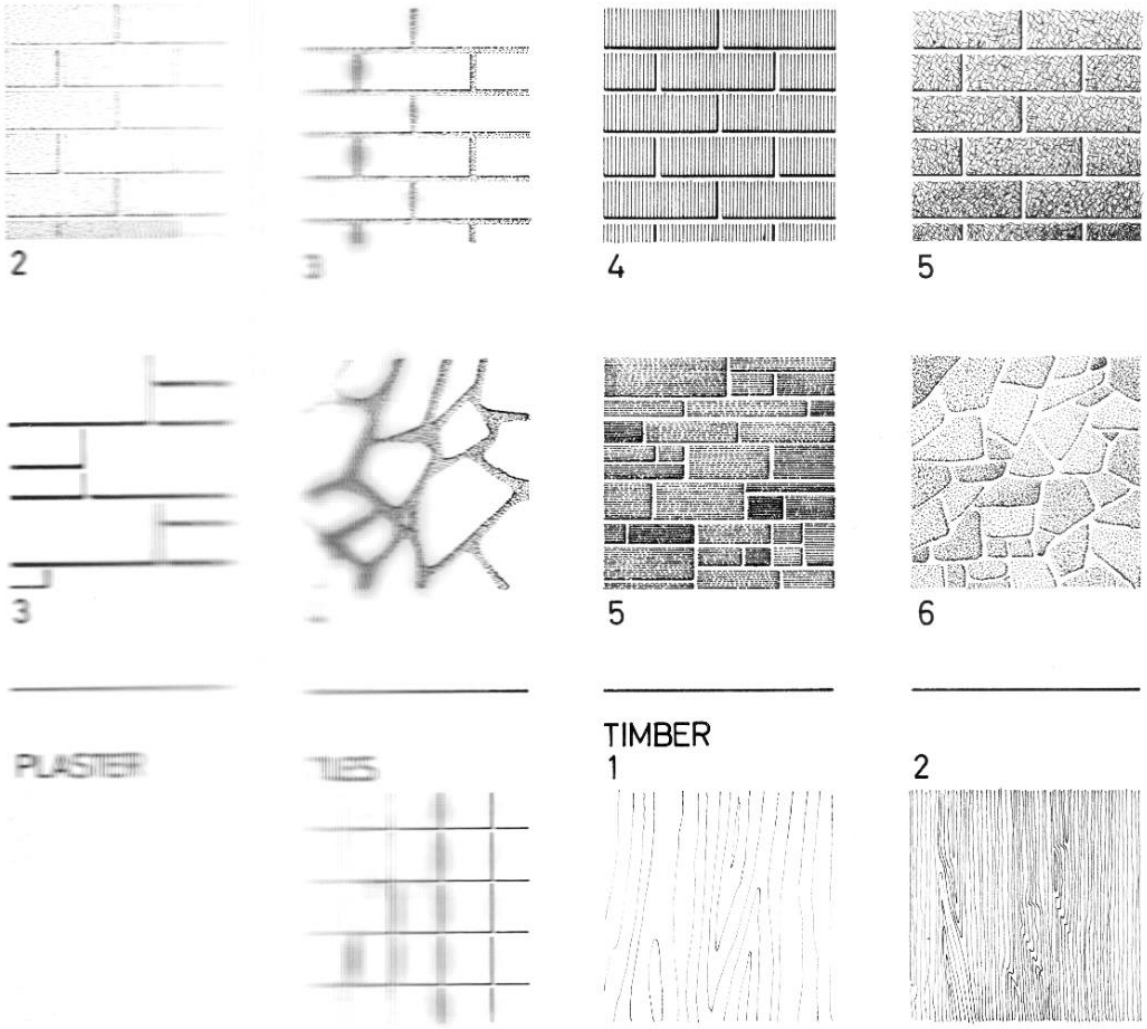
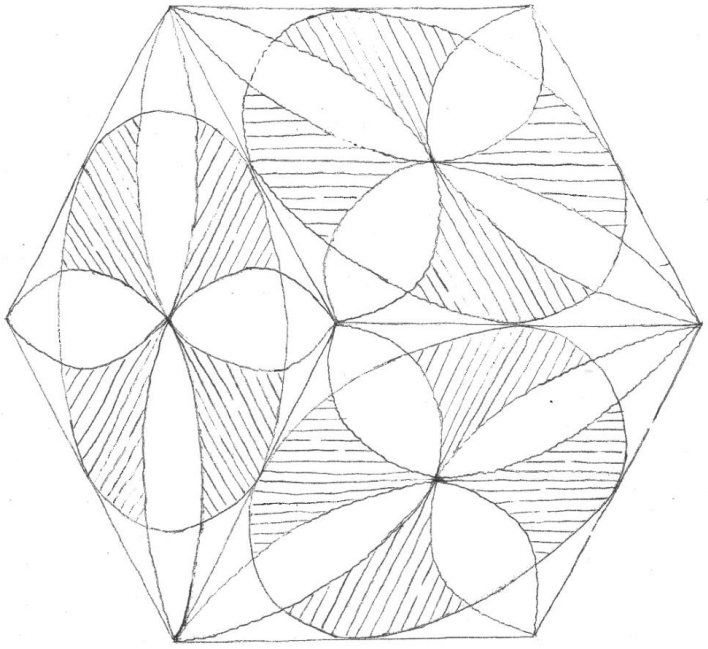


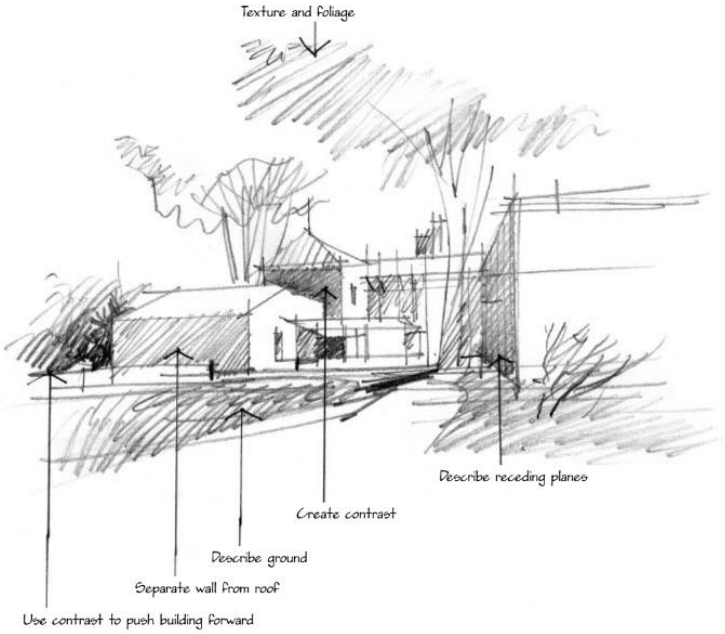
Fig. 88 A few possible techniques for showing various materials used in buildings.

There is probably no limit to the different methods which can be used to achieve the desired results. The examples shown are meant as a guide only; the draughtsman will find his own method of representing materials, depending on the style or technique of the drawing.


2
4
5
3
5
6
TIMBER
1
2



CREATIVE USE OF TEXTURES



Thomas C Wang, 2001, Pencil Sketching, 2nd Edition, John Wiley &Sons, New York, USA

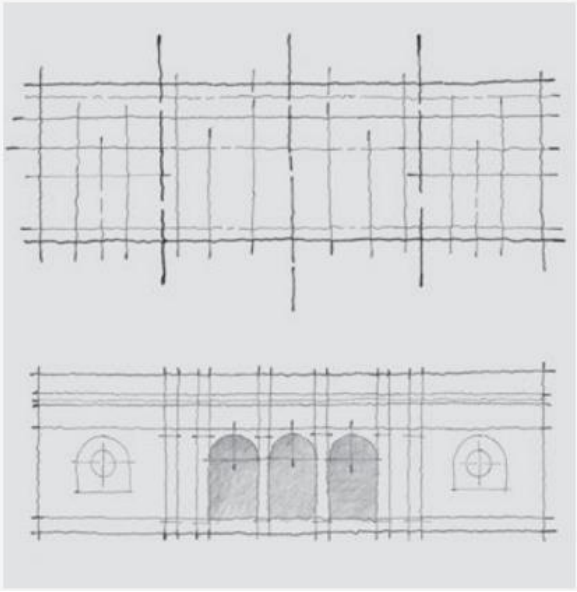
Start and stop the lines. Begin and end the line with a forward and backward stroke. This is done for two reasons. First, the strong beginning and end is an optical illusion in which the line appears more solid on the page. The line appears to have a definitiveness. Second, and slightly related, a definitive beginning and ending is a way to make a definitive mark, if only for this particular study, that the line begins here and ends there. There is no weakness or frailty. The line is strong and distinct – for at least that drawing. Subsequent drawings have their own beginnings and endings.

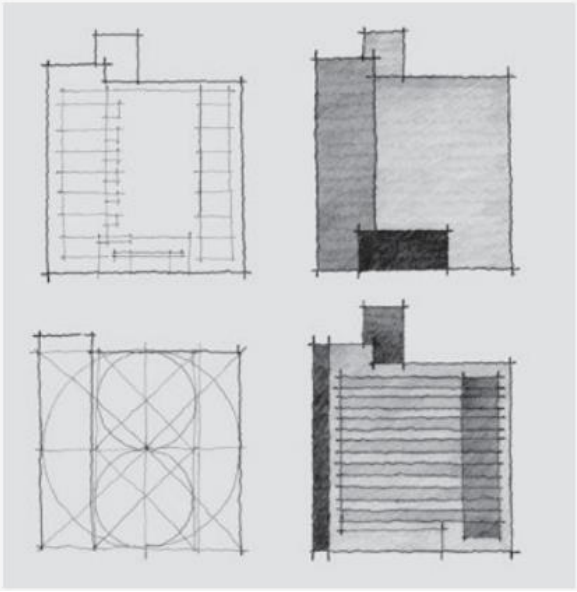
Cross corners. When two or more lines meet, cross them slightly. This is an optical illusion that makes the corners, and the drawing overall, for lack of a better word, more substantial. When the lines do not cross, your eyes will automatically connect them, with the result that the connections are weak and rounded. When they cross ever so slightly, the corners are emphasized and solidified.

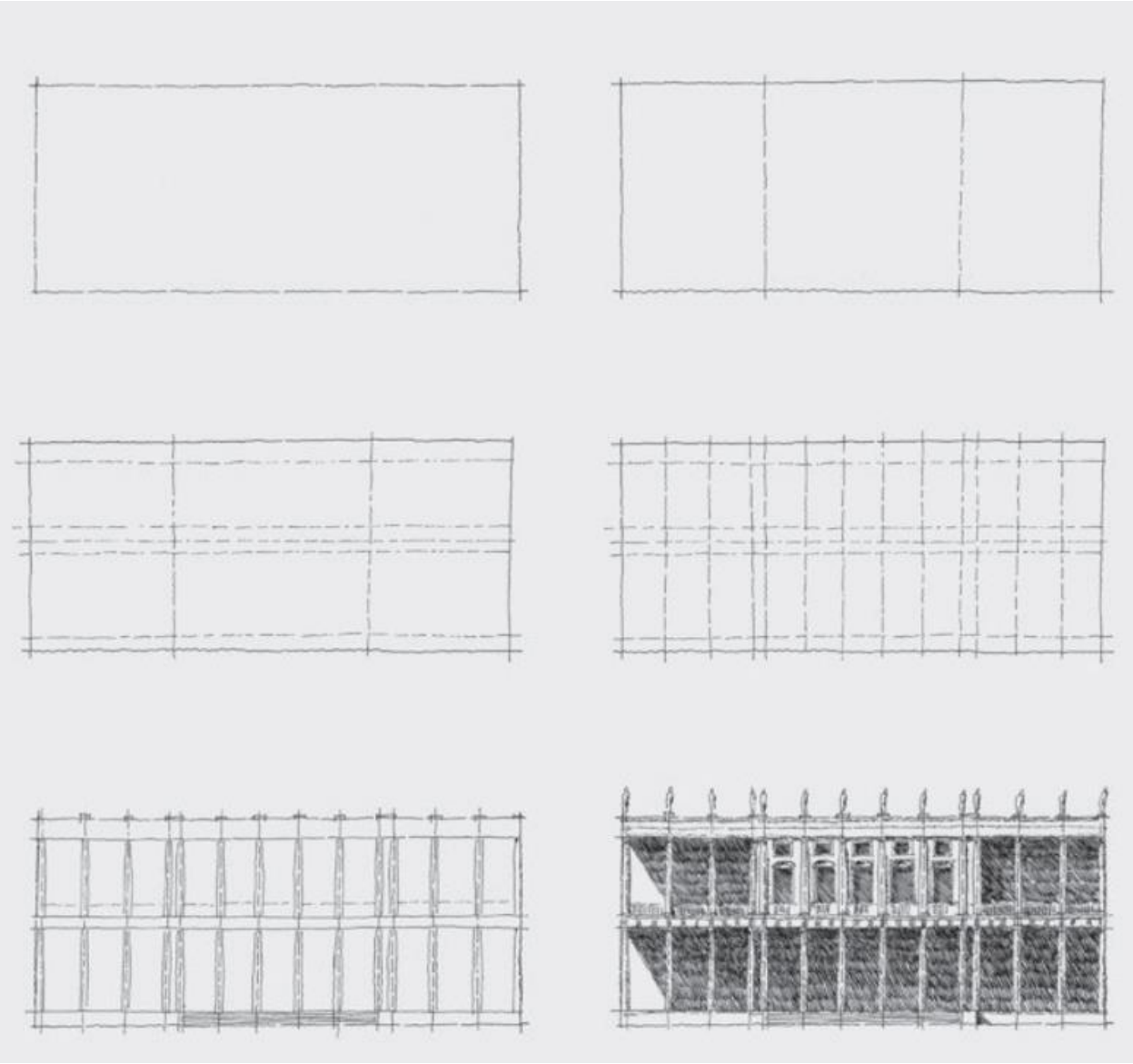
Practice swimming by swimming. Sometimes there is a tendency to make a series of tentative and scratchy lines so that one day you can make one long line. This fallacy is similar to learning to swim by slowly moving one leg for a day, then another leg the next day, followed by a hand in the water the day after that and so on. The best way to learn a particular swimming stroke is to get into the water, with someone to help mind you, and do that stroke. Likewise, when drawing, it is best to draw in order to draw. Draw complete lines. At first it may be inelegant, but eventually (and usually quickly if practiced correctly), lines become beautiful and second nature.

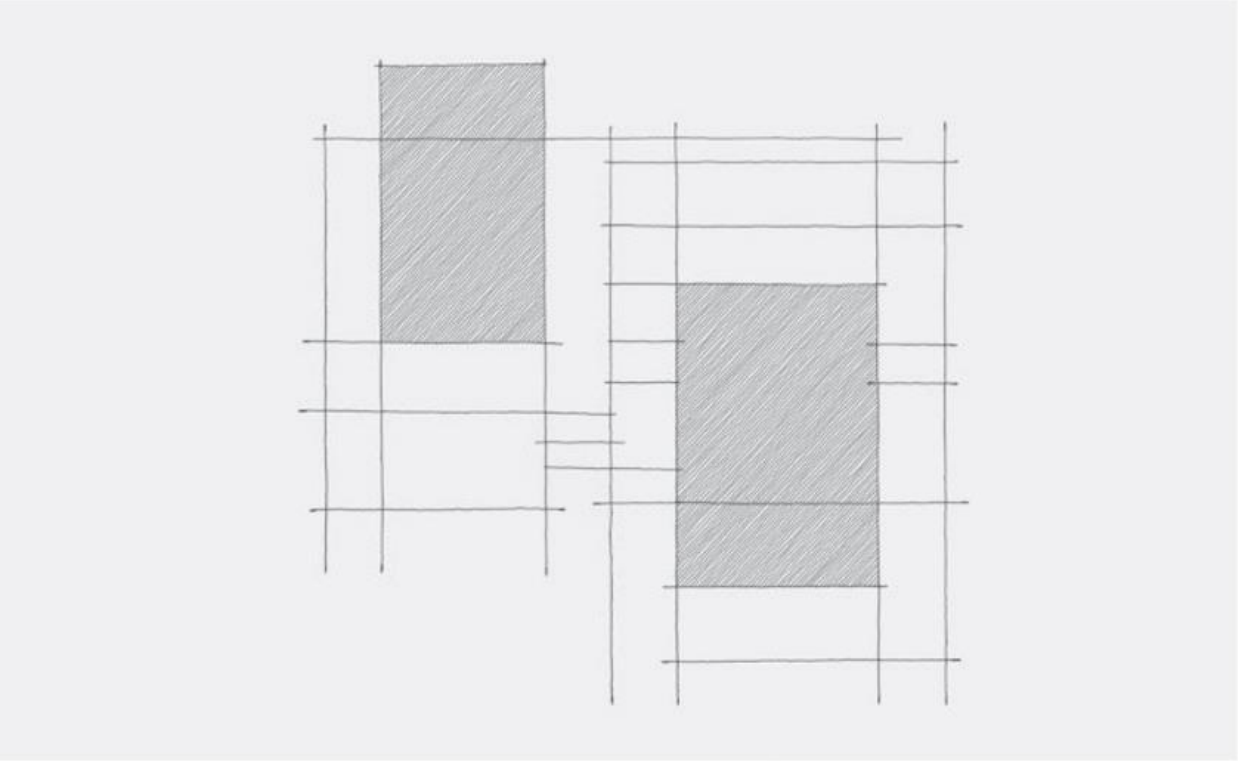
Opposite page:
Top: Wiggly lines, guidelines with textures and tones
Bottom: Varied line weights and types to make a hierarchical tartan grid

Top: Varied line weights and tones used to diagram a façade
Bottom left: Drawing is like writing with a pencil
Bottom right: Varied line weights and types in analysis (drawing by Gregory Pray)

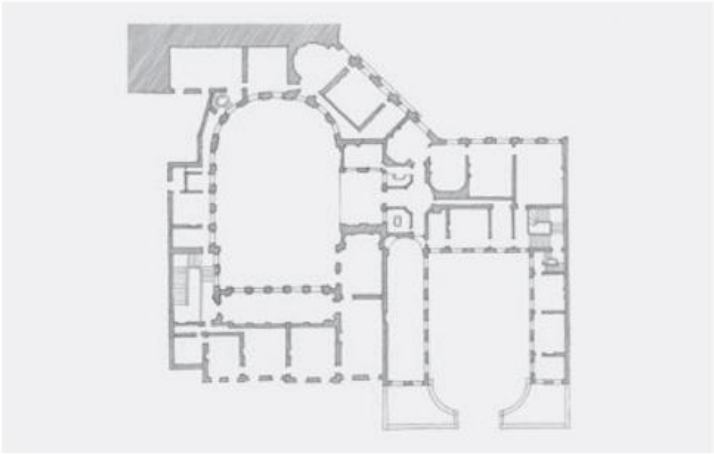




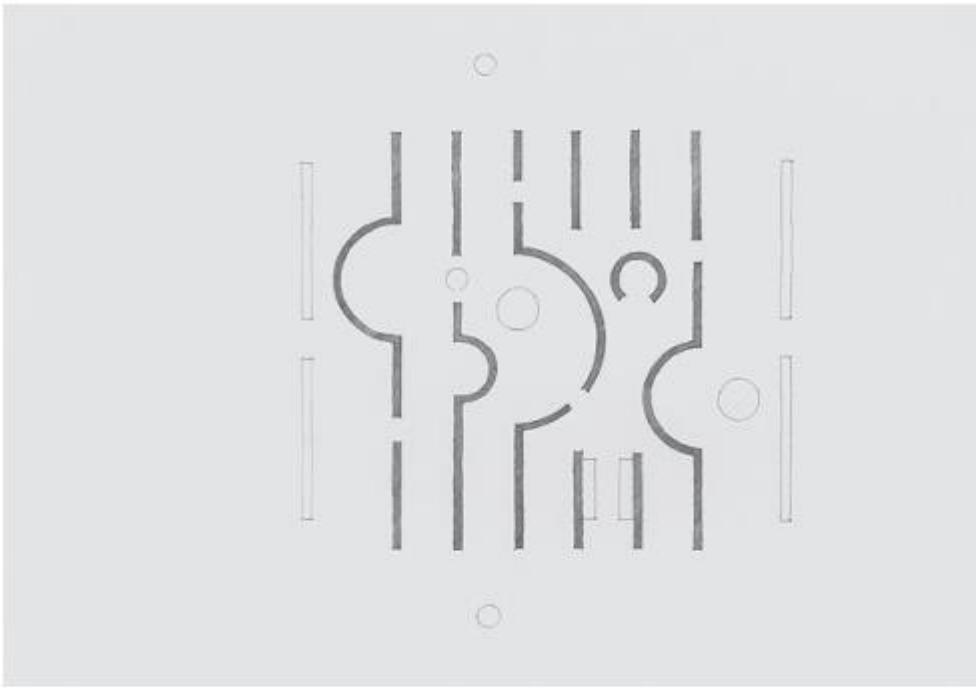


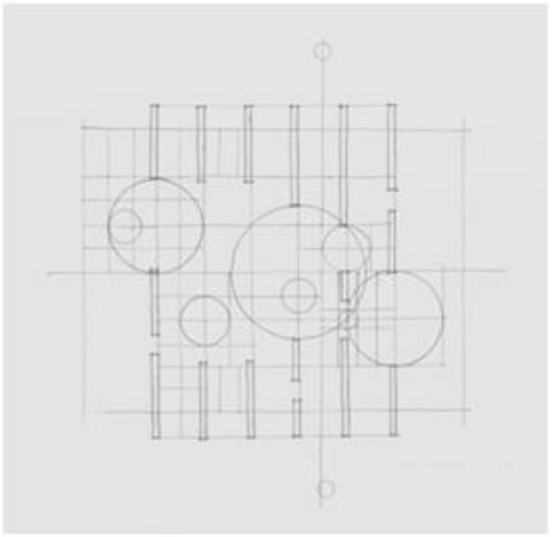


Shifted courtyards linked by a common grid



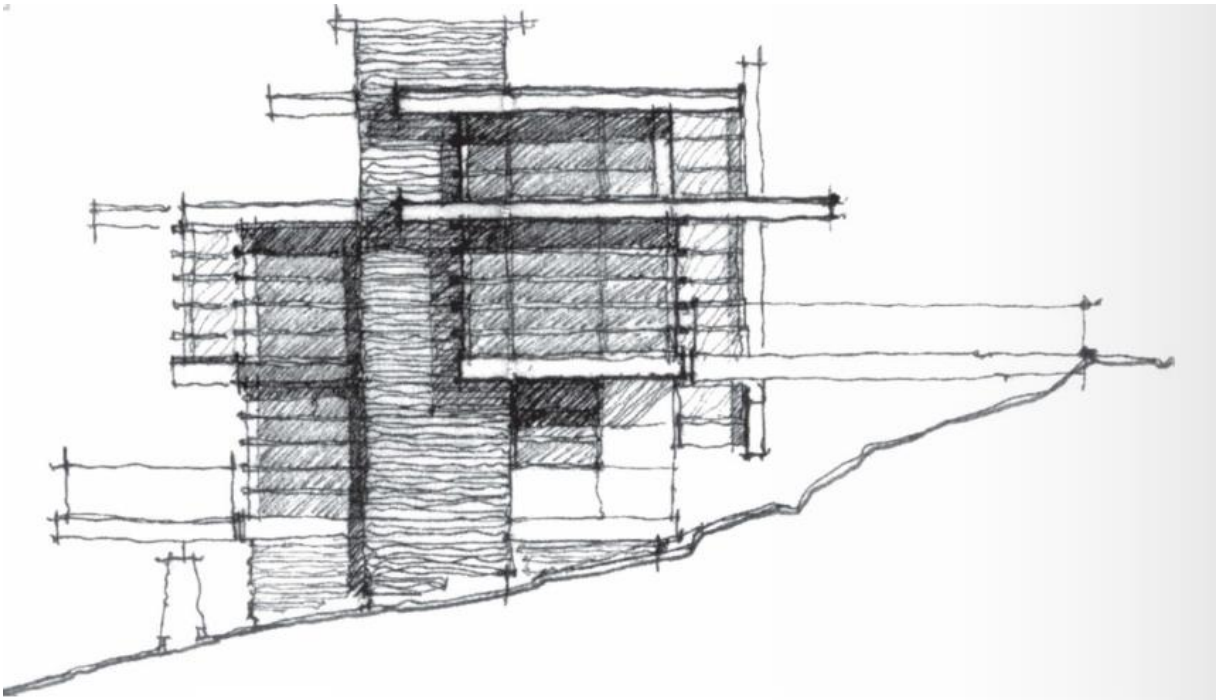
Main level floor plan





Ground level floor plan
Underlying grid and circular geometries

The Sonsbeek Pavilion
Arnhem, The Netherlands, 1965
Aldo van Eyck



Volumes and Shapes

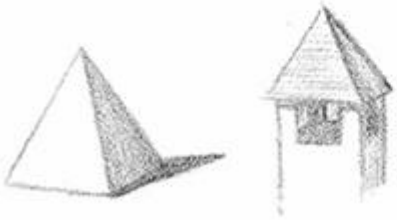
ALL DRAWING STEMS FROM ONE OR MORE OF THESE FORMS

ROUND

SQUARE

CYLINDRICAL

CONICAL



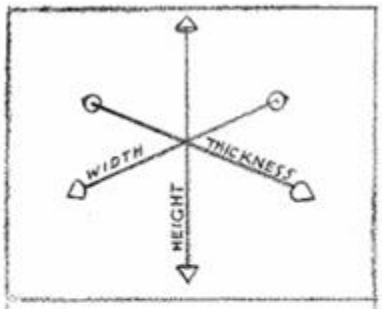
PYRAMIDAL

10

THE FIVE P'S

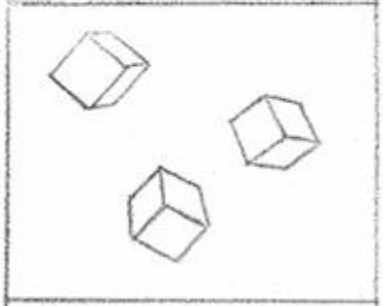
1

PROPORTION
The three dimensions



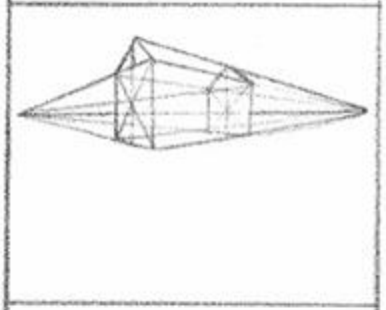
2

PLACEMENT
A position in space



3

PERSPECTIVE
Relationship of viewpoint to subject



4

PLANES
Surface appearance as defined by light and shadow

5

PATTERN
The deliberate arrangement of the tones of the subject

Building a Drawing

A building is an assemblage of elements layered one on another. Upon conceptual and physical foundations rest more complex frames that, in turn, support increasingly detailed elements and ideas. The building materializes as a whole so that, in the end, the overall and the detail interlink as a totality.

Likewise, when drawing at a site, it is helpful to start with the framework and then allow the drawing to grow into a complete entity. Developing out of a process, the drawing in turn reinforces the process of seeing layers and hierarchies and of seeing the comprehensive interrelationship of detail and whole.

For more practical reasons, beginning with the overall proportions and then adding increasingly detailed information helps ensure that the sketch fits on the page. Beginning a drawing in an upper corner and working at all levels simultaneously toward a lower corner may result in a drawing that, if finished, is off the page's edge. Additionally, a correctly proportioned façade is more likely to support correctly proportioned bays, which in turn fit correctly proportioned windows. If the overall form is out of proportion, each subsequent element necessarily will also be out of proportion to make it fit.

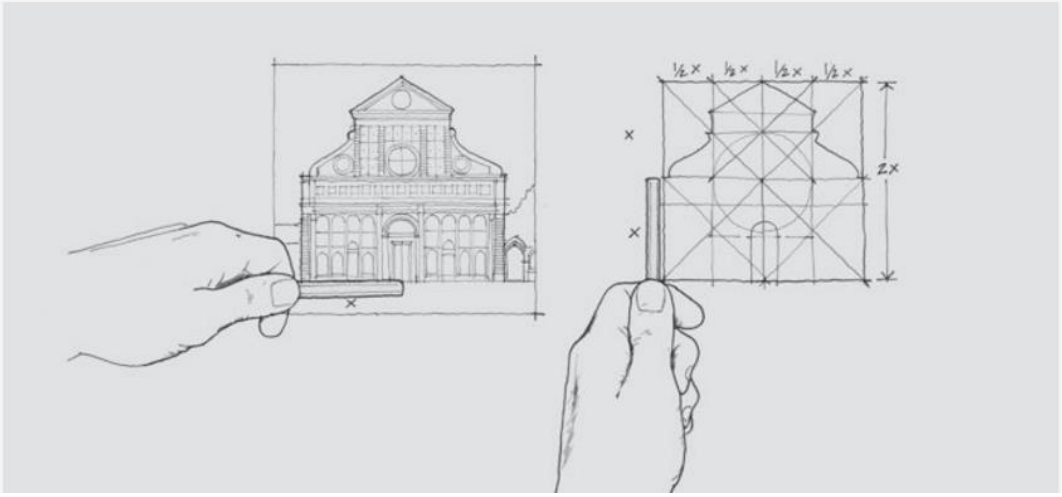
Two ways to establish a framework and mapping the proportions are using either a length of a pencil or pacing out dimensions of a façade, an interior volume or an object. For the pencil technique, while holding a pencil between your forefinger and thumb, fully extend your arm so that the distance from your nose to the pencil remains constant. Look down your arm at your subject with your pencil in the foreground. Adjust your pencil's length as needed to match an element on the façade, such as a bay or floor height and let the pencil-to-thumb length be a standard unit of measurement.

Count the number of units for verticals and horizontals and then convert and transfer those units and their multiples to a unit on your page. Continue to adjust your pencil-to-thumb length for smaller elements as needed. You can also

establish overall proportions by pacing off a room's width and length or a building's length. Make normal steps and count them out. Note the overall number and, most importantly, the number at significant moments, for example the column bays or changes in material. Transfer the number of steps to units on your page as in the pencil technique. For example, a courtyard may be 30 steps by 45 steps, with colonnades five steps on all sides. Those units, 35 x 45 with five on each side, can then be drawn to a scale so that the drawing fits on the page.
Draw the larger framework to its complete extent, using only guidelines while noting significant subdivisions. With these guidelines in place, begin to slowly but steadily overlay increasingly detailed information. Even if you do not complete all of the detail, you will have the overall idea of the building firmly established.

Opposite page:
Drawing of Palazzo Chiericati, Vicenza, Italy, scanned at six different stages from guidelines to finished drawing

Top: Using a pencil to find proportions
Bottom left: Underlying guidelines to draw the interior volumes (drawing by Fred Scharmen)
Bottom right: Pacing out a room's or square's proportions

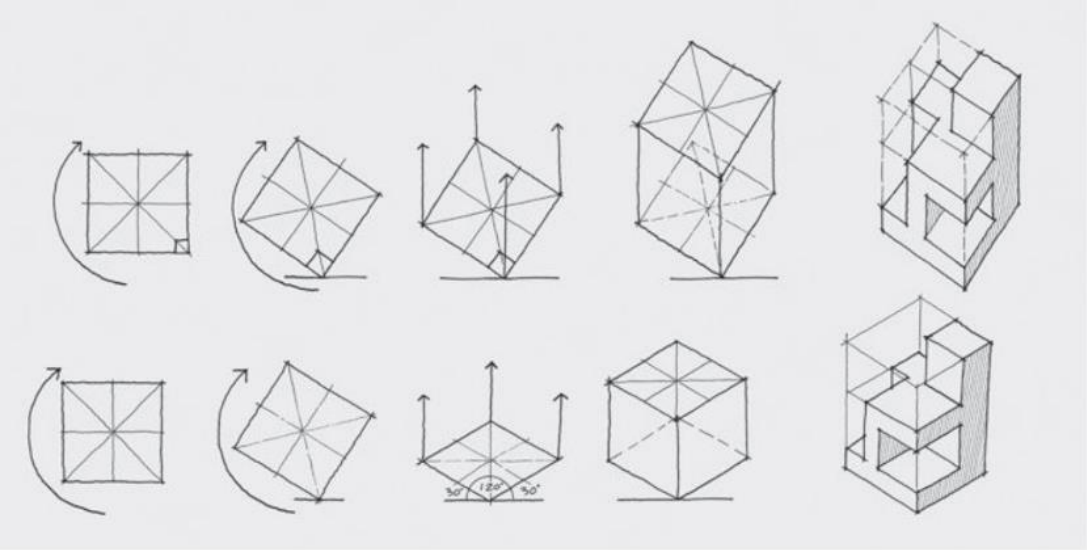


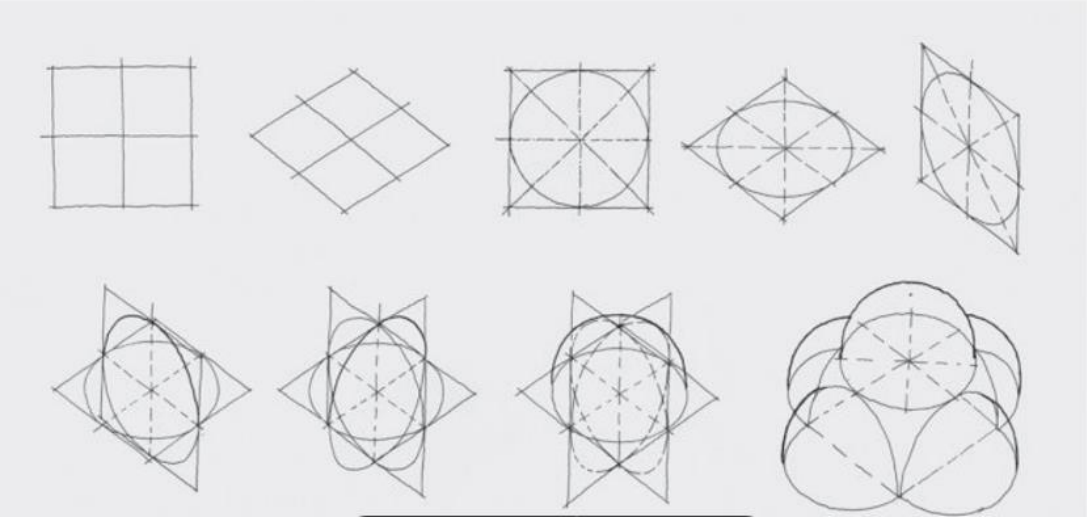
Sketching in Axonometric

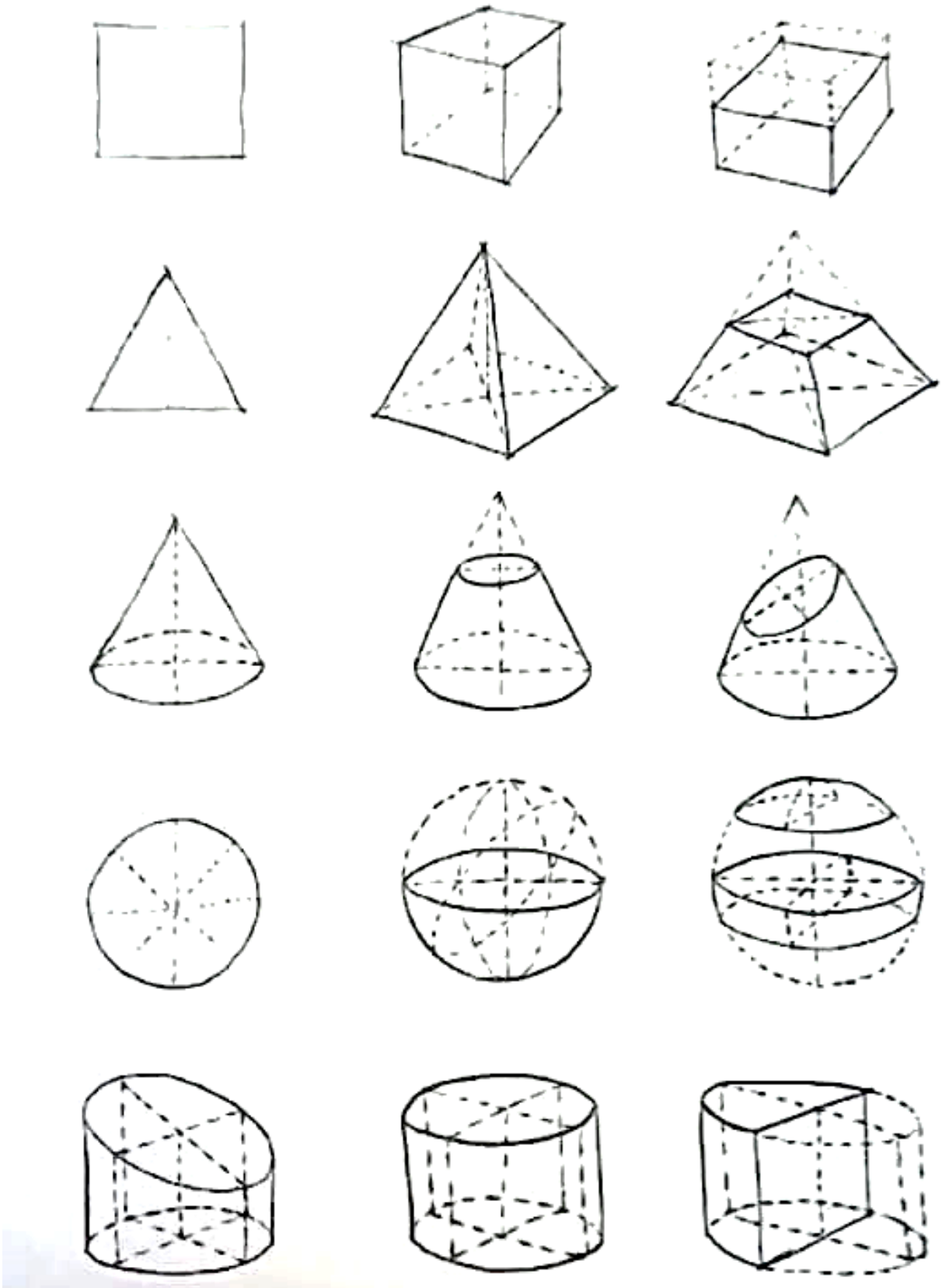
An effective method to analyze the designed environment is through axonometric drawings. Axonometrics are three-dimensional representation that, unlike perspectives, maintain all the dimensions and proportions of the space. In axonometrics, at least three sides of a space or form can be seen simultaneously. For example, the floor and two walls are drawn at the same time. This simultaneity has a great advantage in that it promotes three-dimensional thinking in the analytical and design process. As a three-dimensional Cartesian framework, complex shapes can be mapped as points and then connected with lines to form planes. For example, circles can be mapped within the x-y-z grid to generate cylinders, spheres, domes, arches or cones. Likewise diagonals, curved planes, steps, subtractions and additions. While there are several types of axonometric drawings, the two most common are the plan oblique and the isometric.

A plan oblique is an axonometric in which the plan or the horizontal plane remains true to its geometric shape: things that are square, circular, oval or of another geometry in the horizontal plane remain square, circular, etc. yet are rotated 30 to 45 degrees from the vertical. Once rotated, vertical lines project up and remain parallel to shape the volumetric form. Isometrics are similar to the axonometric; however, the horizontal plane's interior angles are obtuse to give the illusion of perspective or a more life-like view. If it is square, the plan becomes a parallelogram. For example, a square plan or horizontal plane in an isometric "flattens" so that its interior angles are between 110 and 120 degrees. As in the plan oblique, the plan rotates and verticals remain true and vertical and parallel, as do all lines parallel to the horizontal plane's geometry.

Once the fundamental rules are understood, the plan oblique and isometric can be used to study complex spatial forms and three-dimensional objects through addition, subtraction, superimposition and point-line-plane mapping. The important things to recall are that the







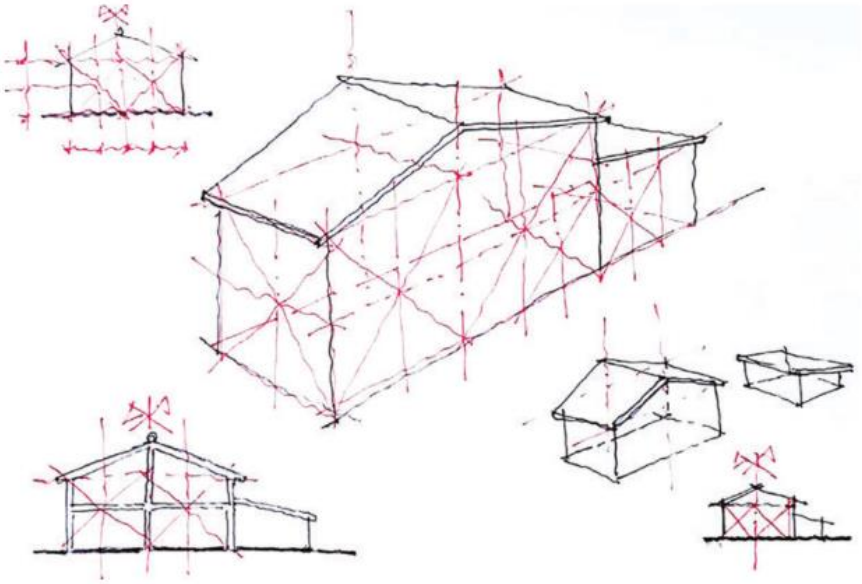
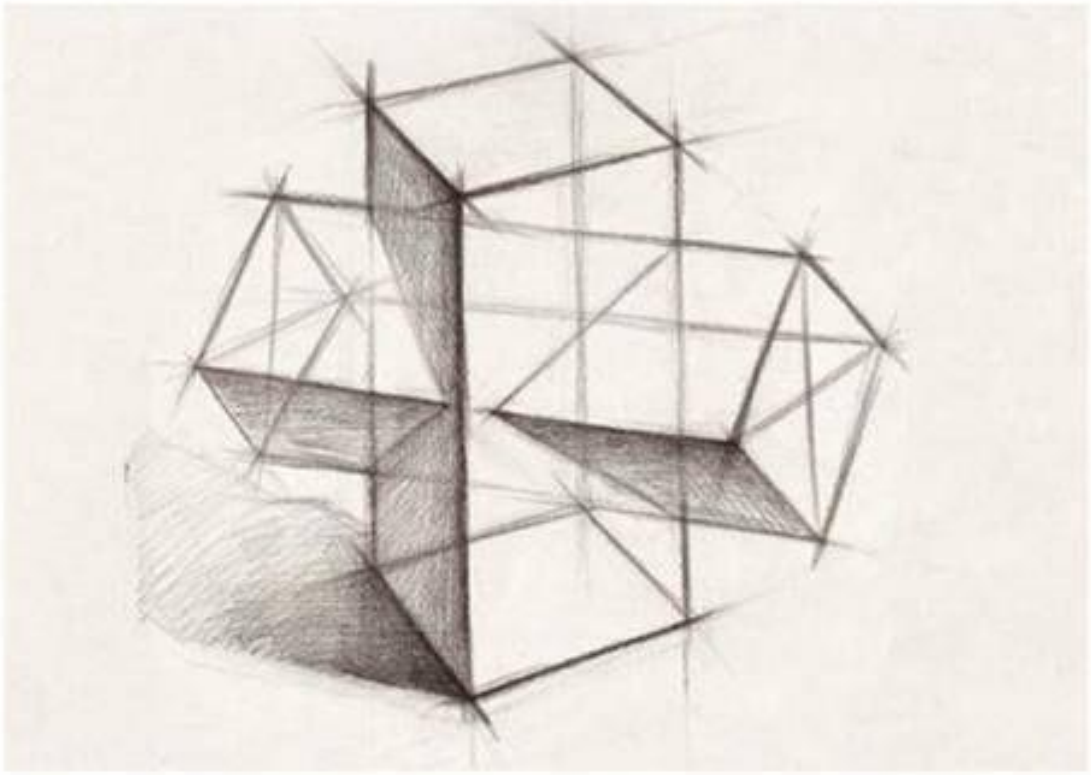


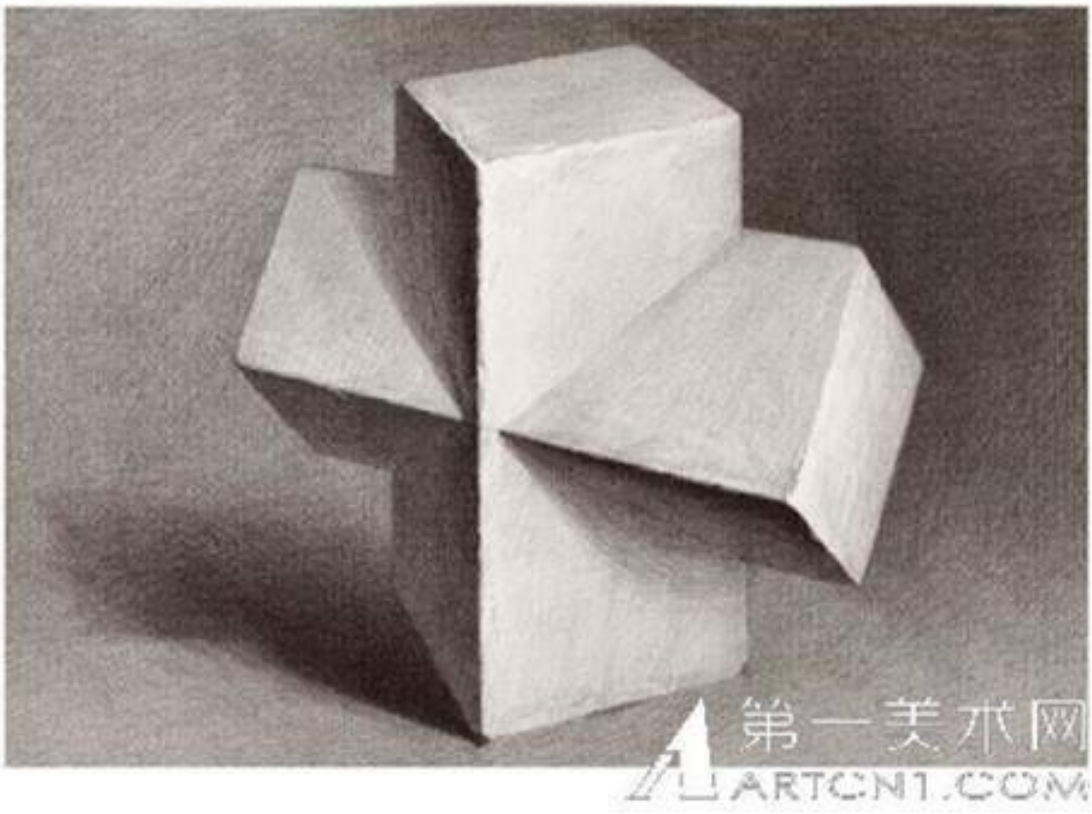
Fig. 33. Study of volume. Drawing by E. C.

Study of the volume of the building: axonometric drawing with 3D proportions.

Study of several details: a door and a window and their position in relation to the surroundings.

Emanuela Chiavoni and Francesca Porfiri, 2022, Freehand architectural drawing Urban sketching, Sapienza Università Editrice, Italy.

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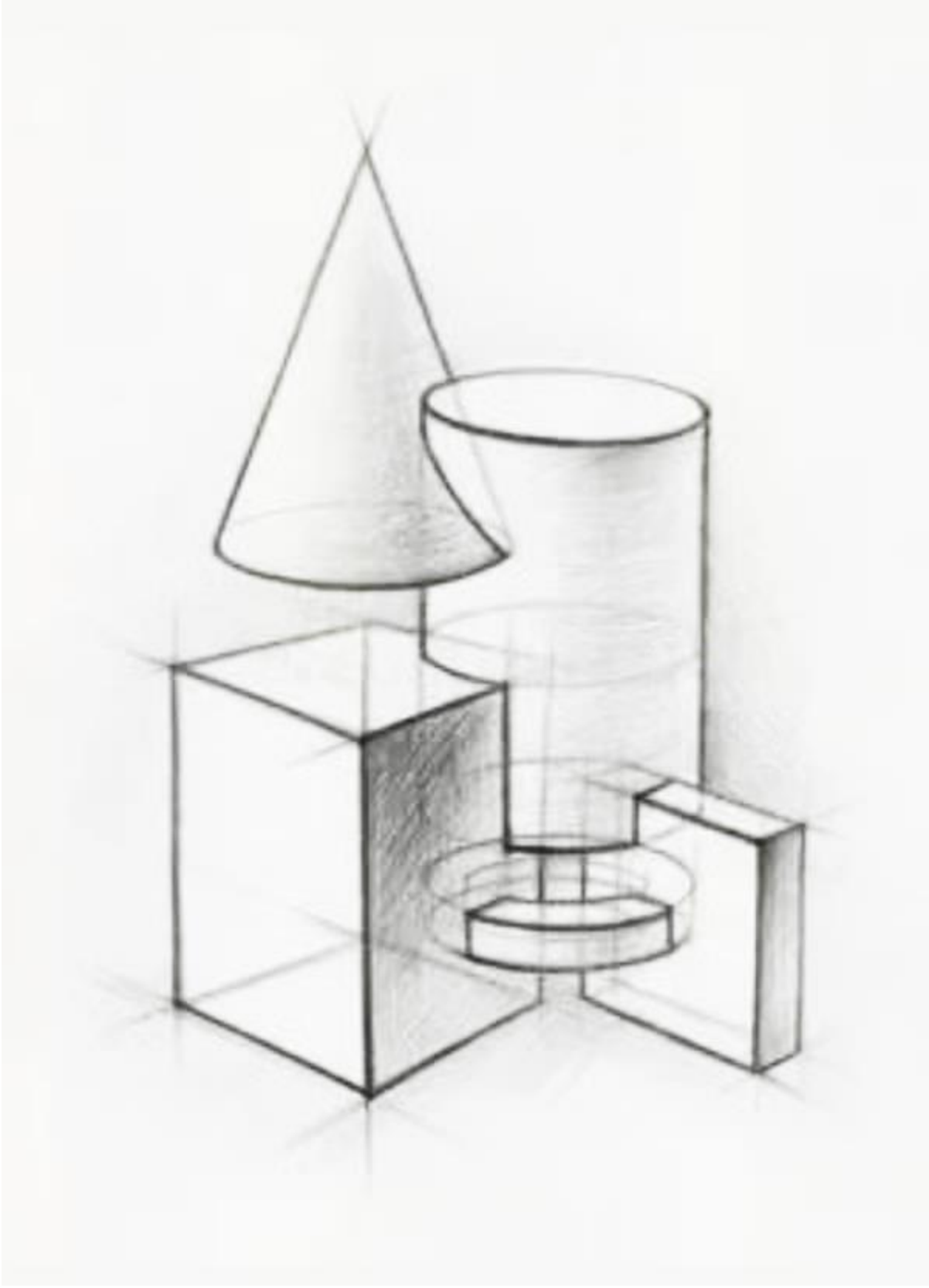

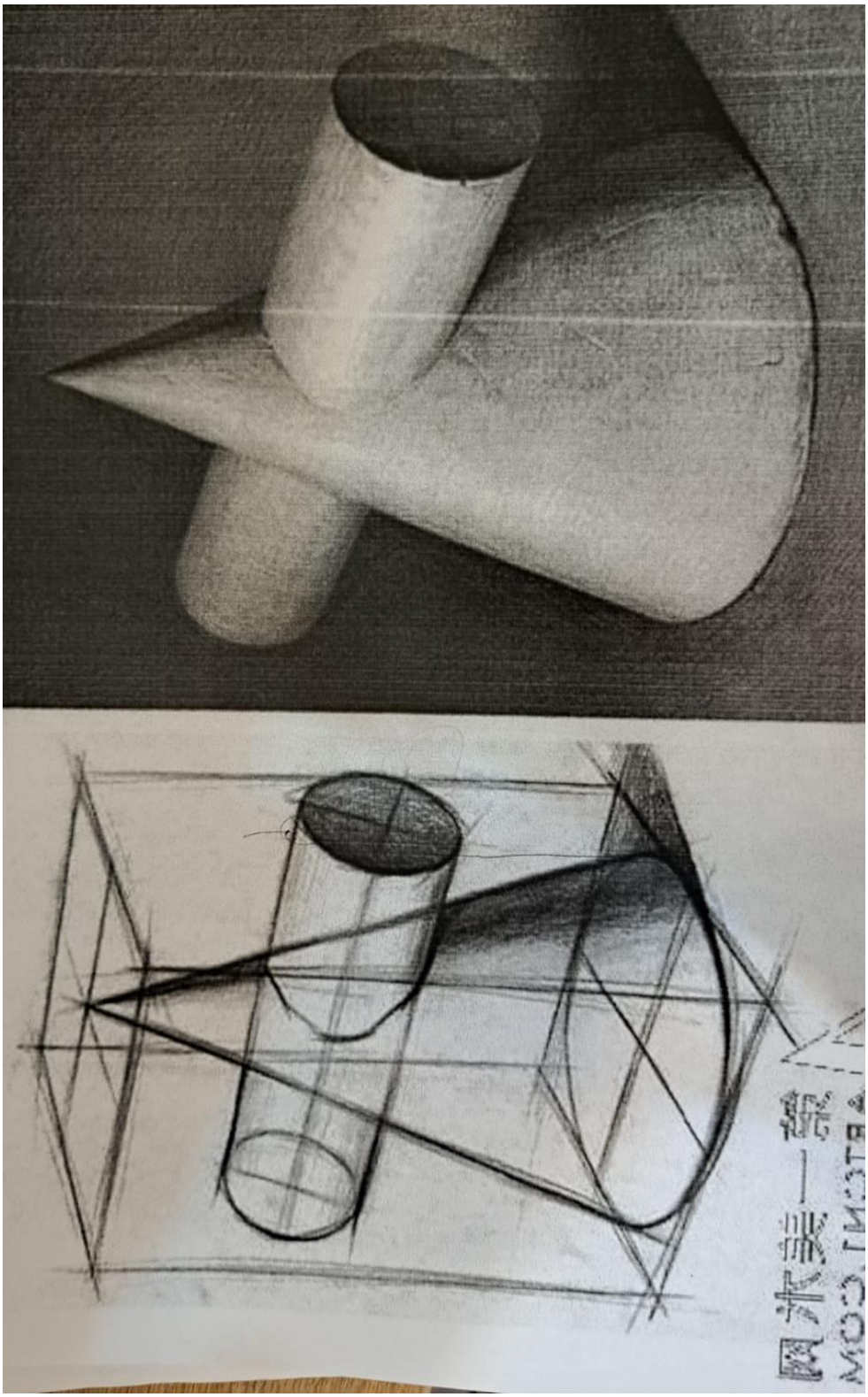


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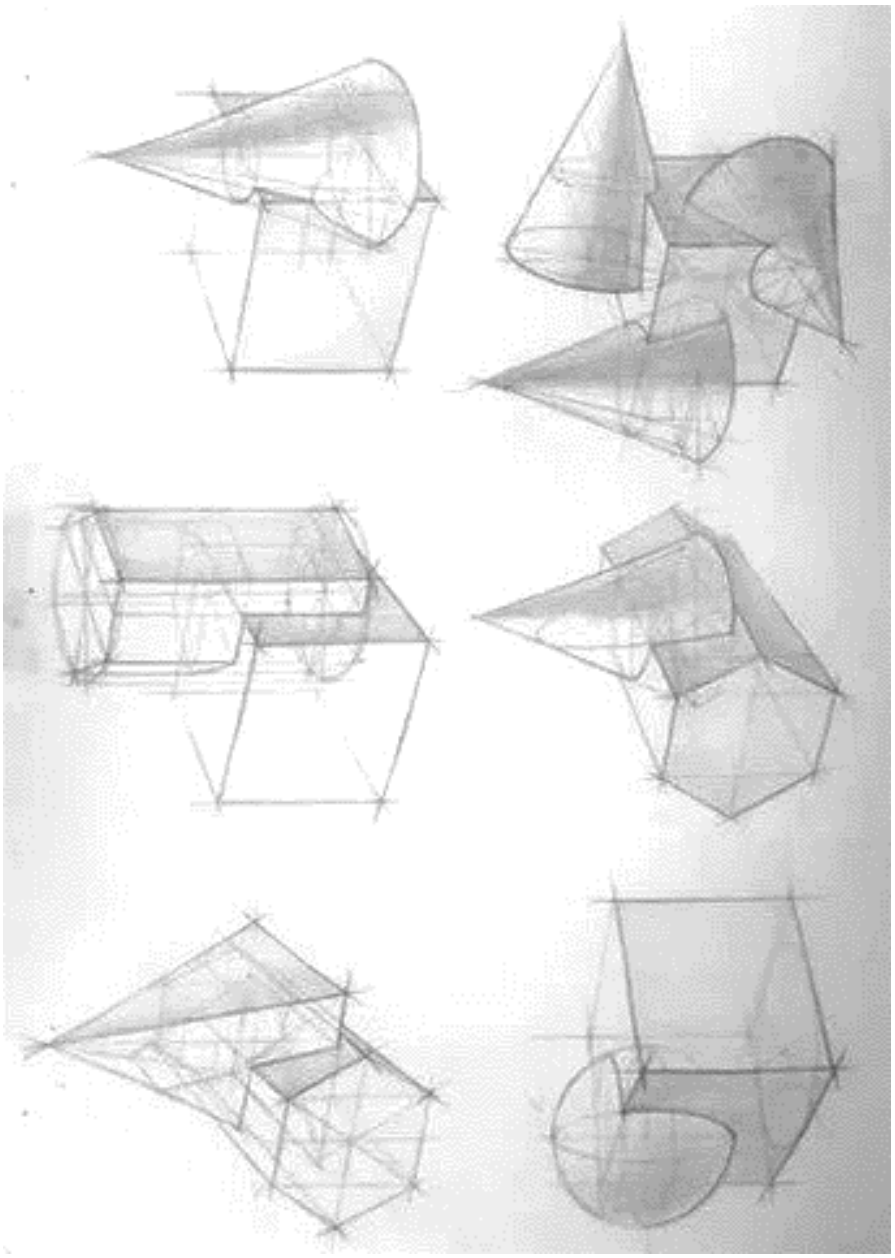

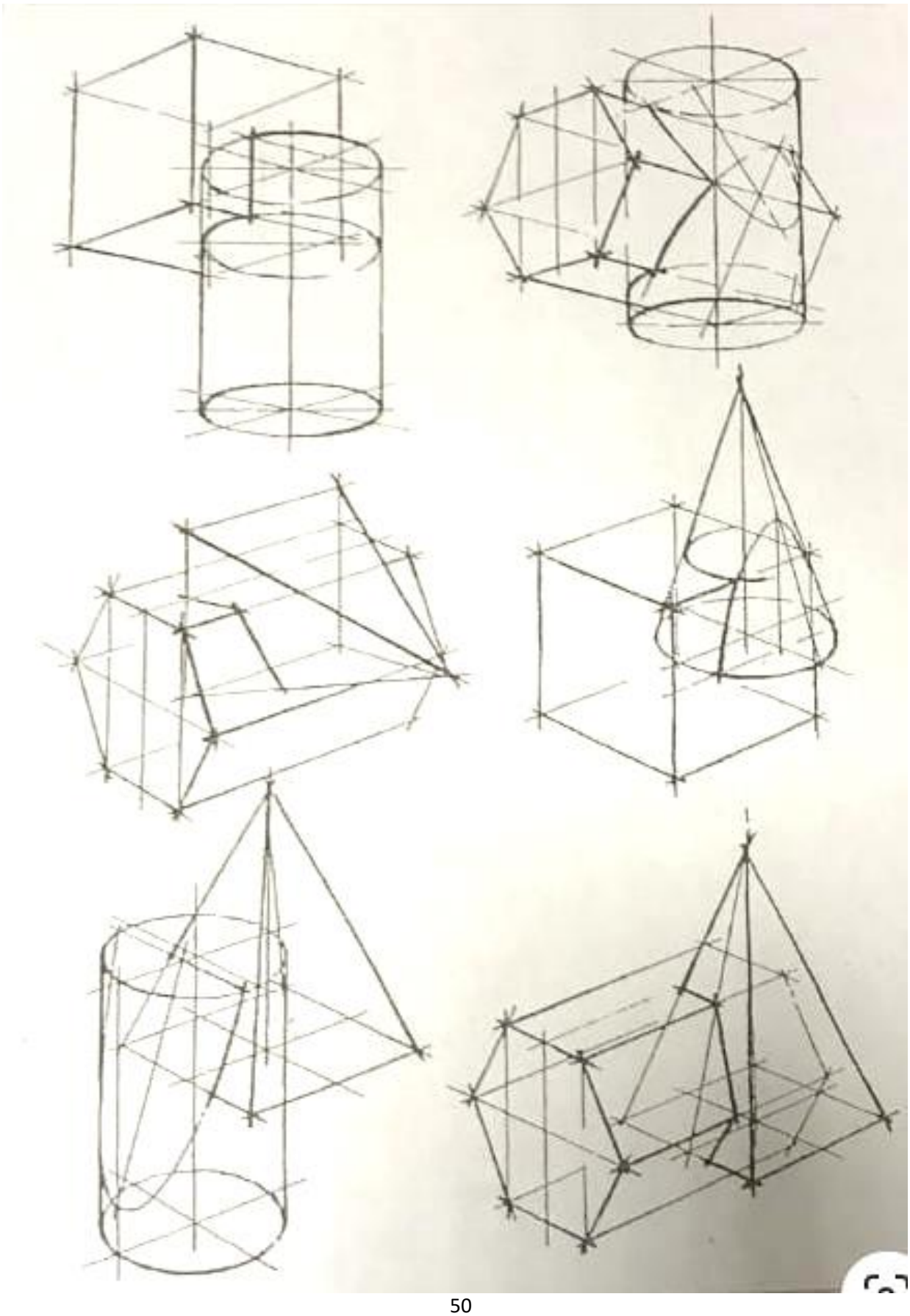

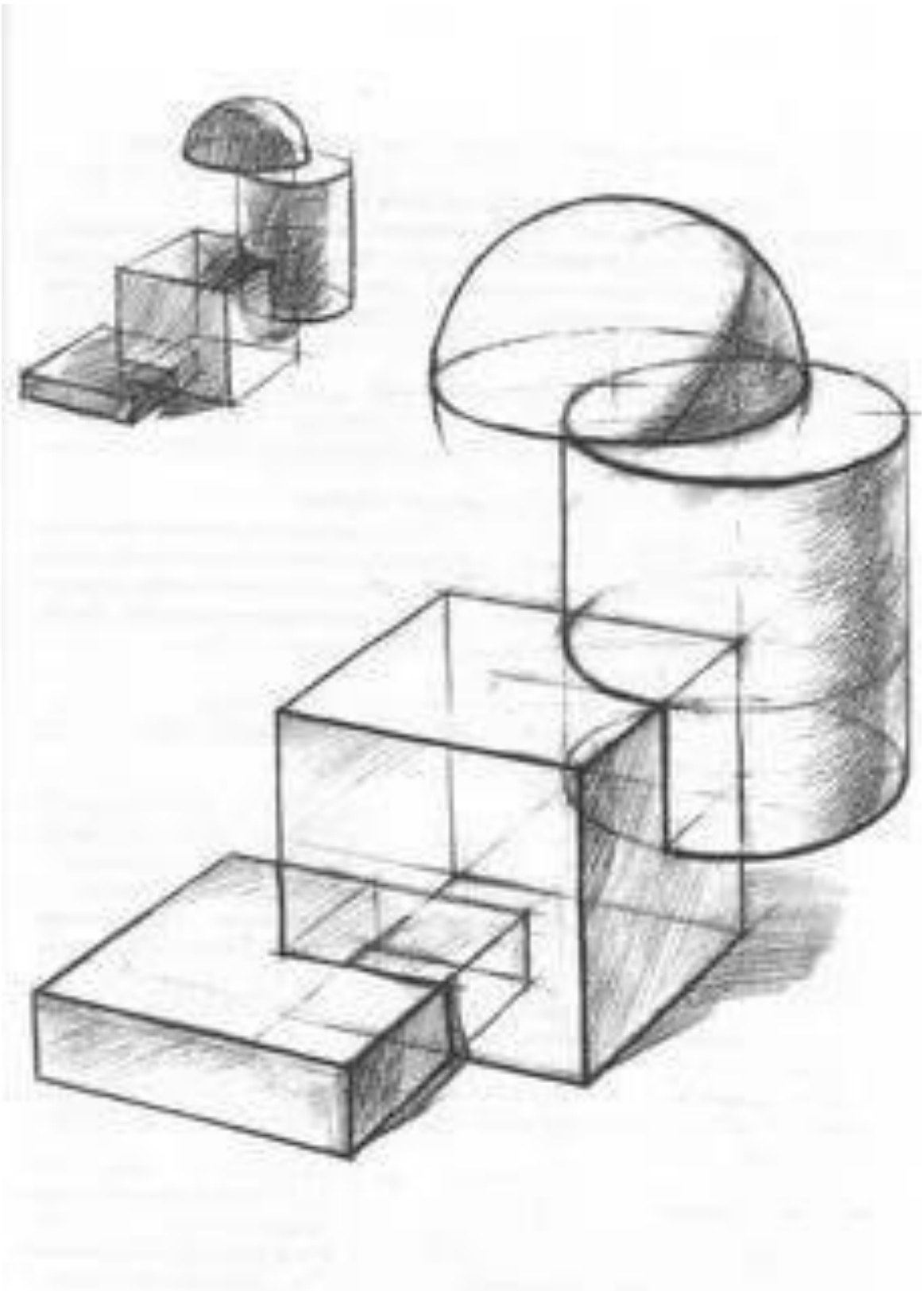

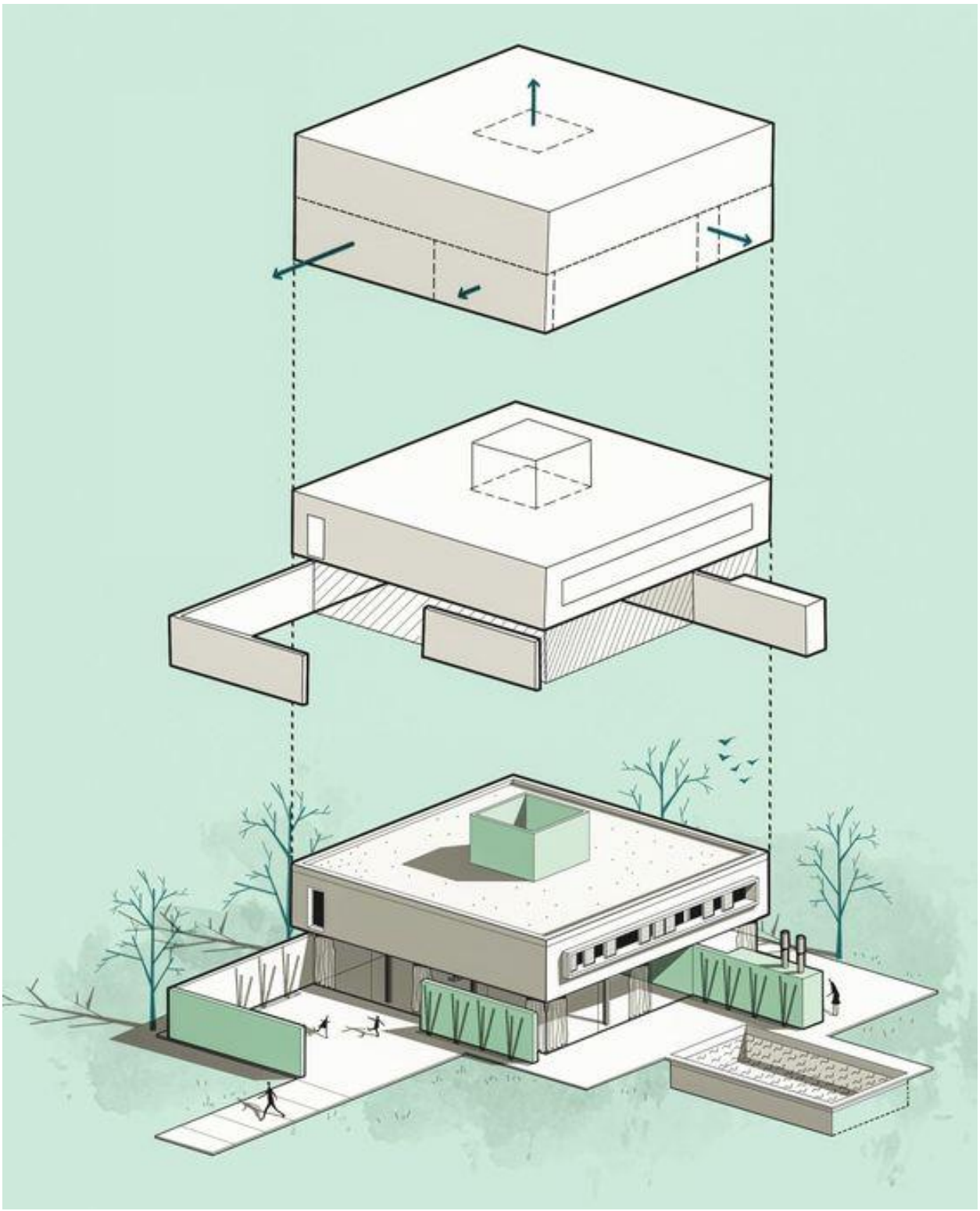

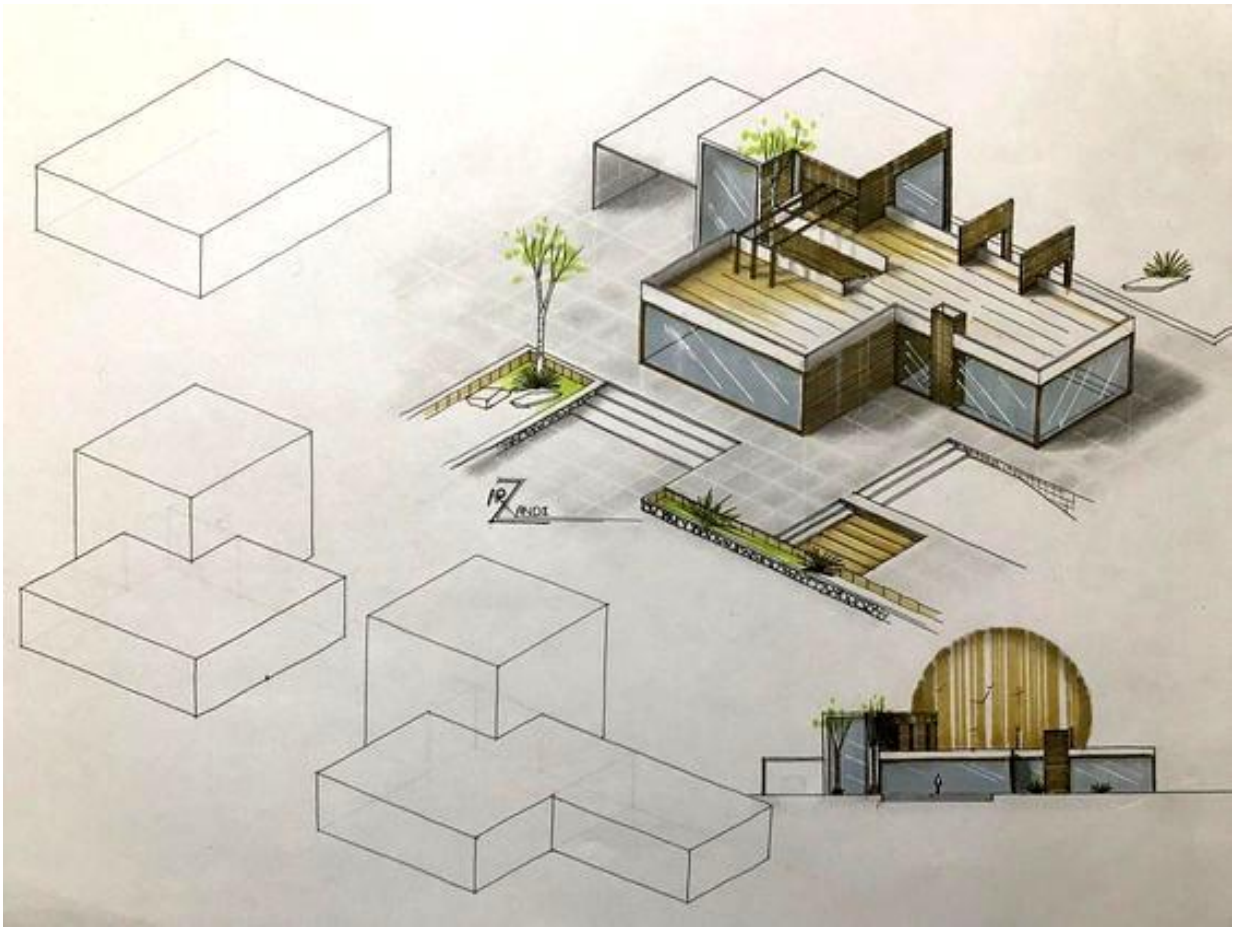

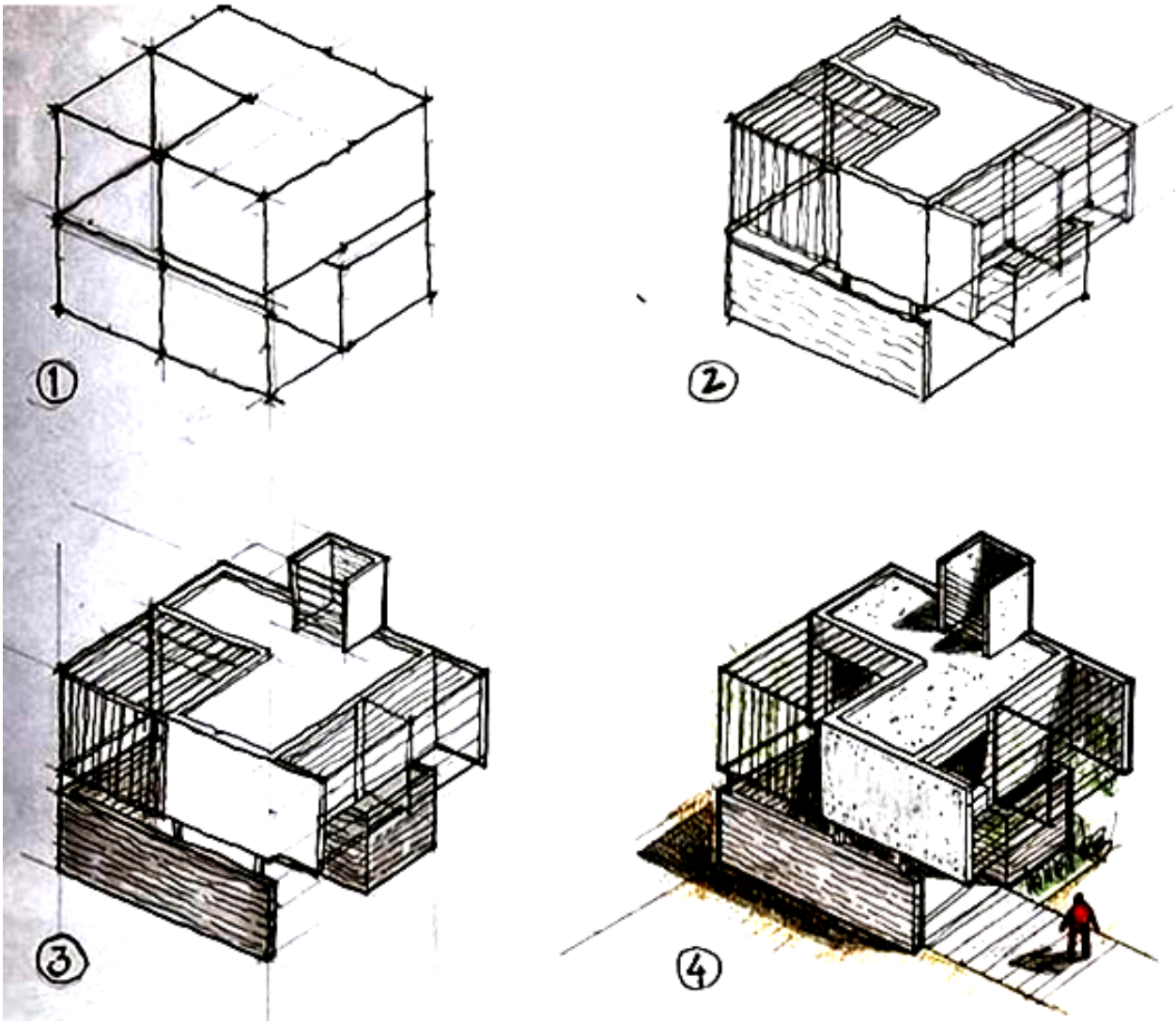
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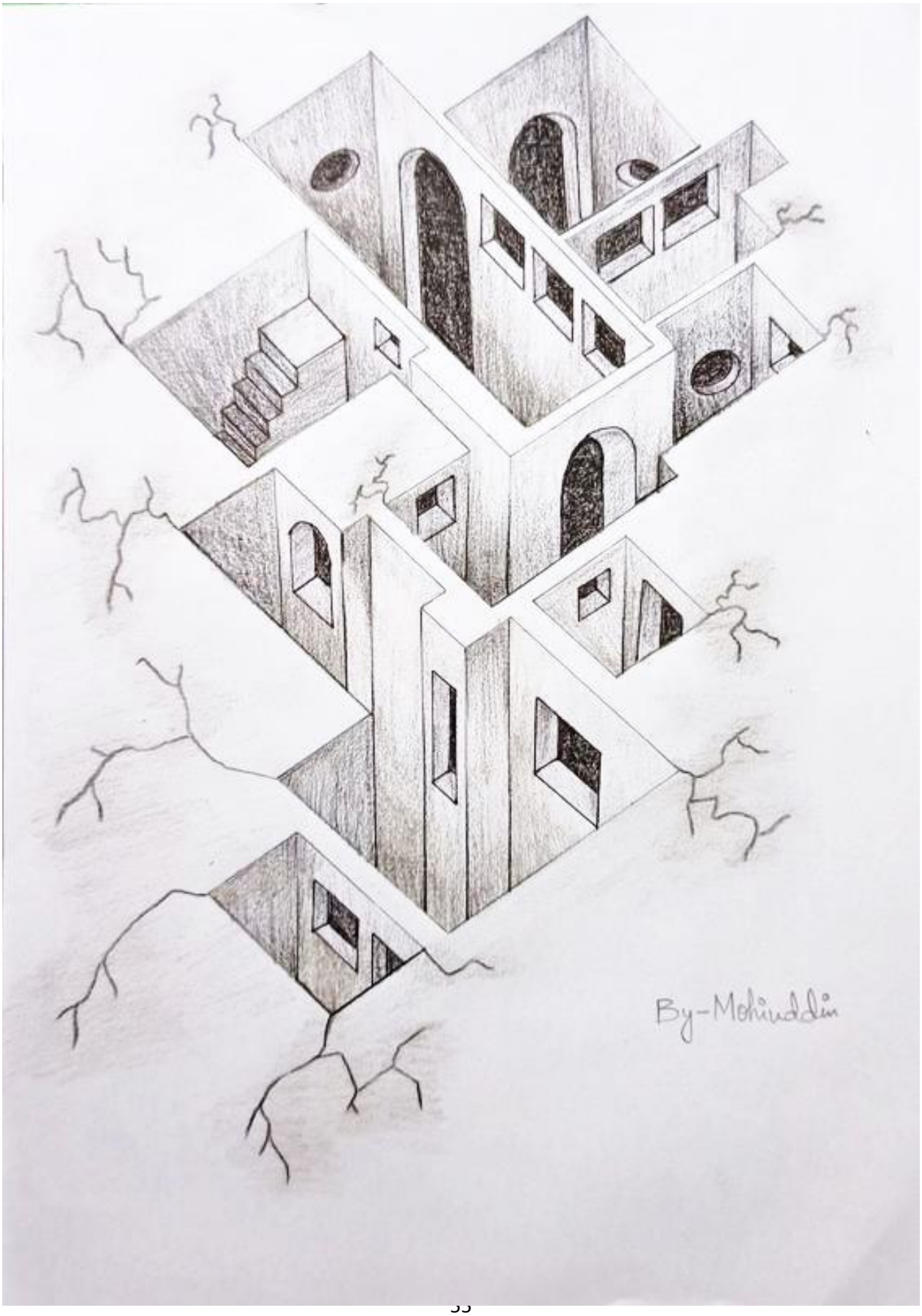
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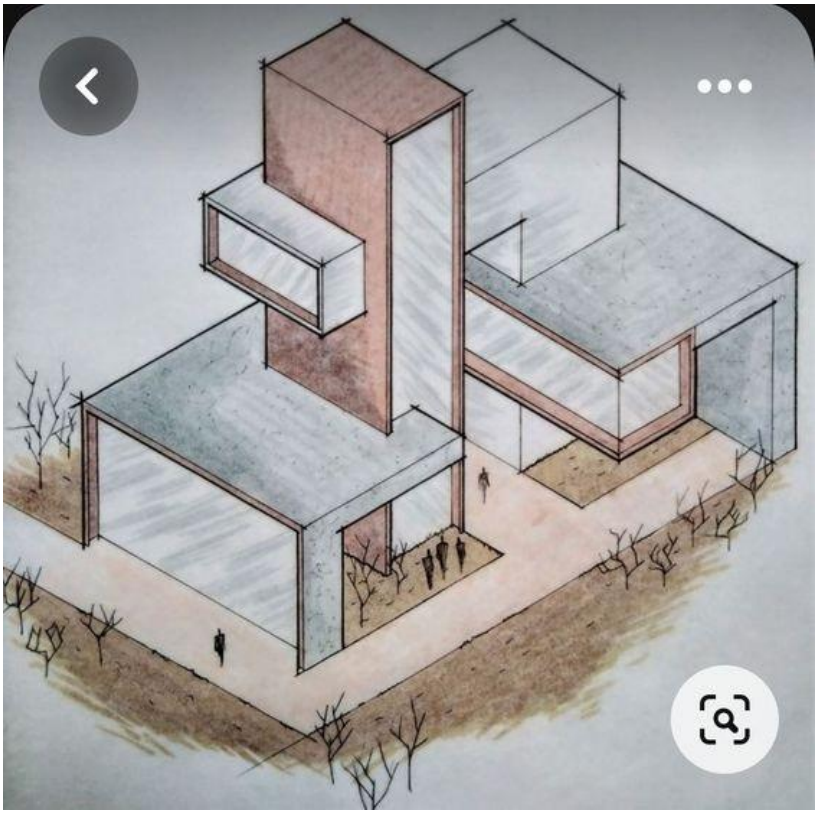
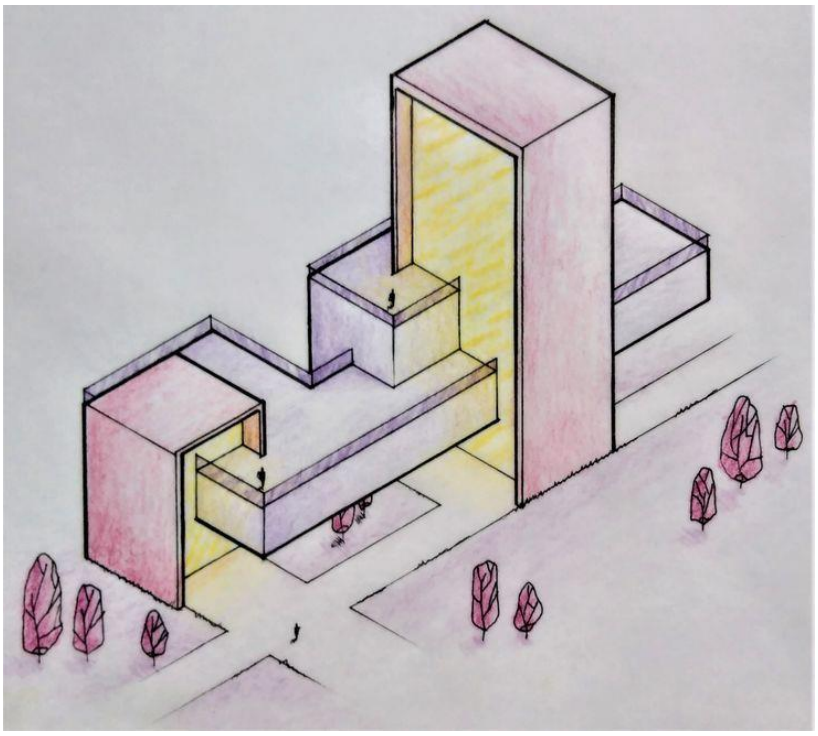


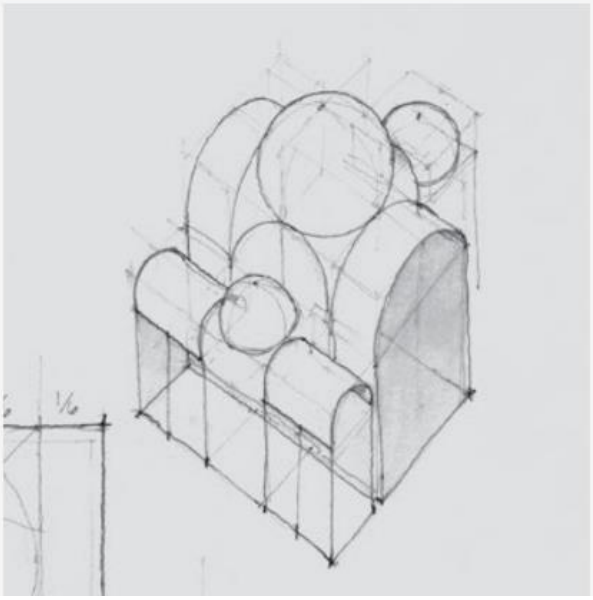


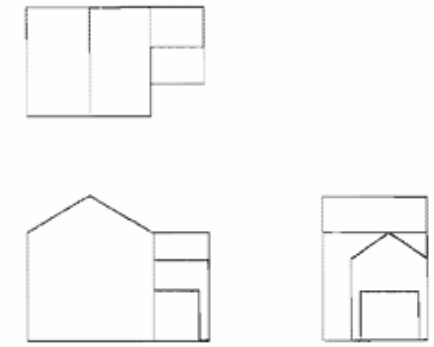
axonometric is a three-dimensional Cartesian grid with the corresponding fundamental geometry: circles are superimposed on squares; cylinders are extruded circles; vaults are bisected cylinders; cones are cylinders that taper to a single point; domes and spheres are rotated circles. Cubes are extruded squares; pyramids are cubes that taper to one point. More complex shapes such as curved or undulating surfaces simply require mapping out the nadir and apex of sine curves or connecting fundamental shapes with diagonals.

Axonometrics are often confusing and disorienting. It is sometimes difficult to discern up from down or front from back. Additionally, while a circle is superimposed on a square, if the square is a parallelogram, then the circle is an oval. Once mastered, however, the thinking behind the process is enhanced and the drawing as a tool of transformation, abstraction and communication is valuable.

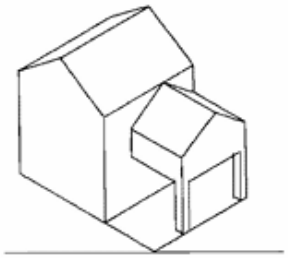
Opposite page:
Top: Plan oblique (upper range) and isometric (lower range)
Bottom: Isometric construction of a dome and half domes

Top left: One quadrant of a dome in plan oblique
Top right: Plan oblique
Bottom left: Isometrics of a mixed-use apartment building
Bottom right: Transparent and exploded isometric of a barrel-vaulted townhouse

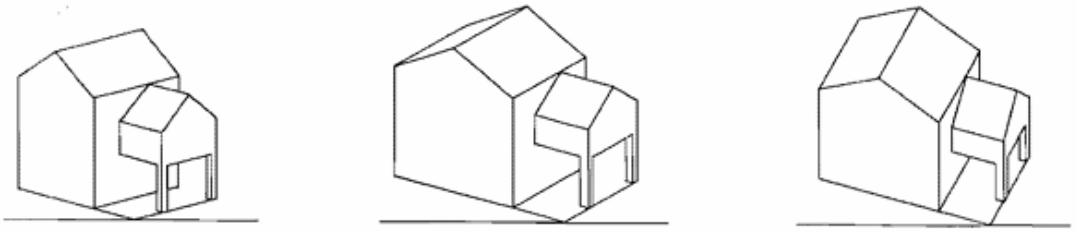




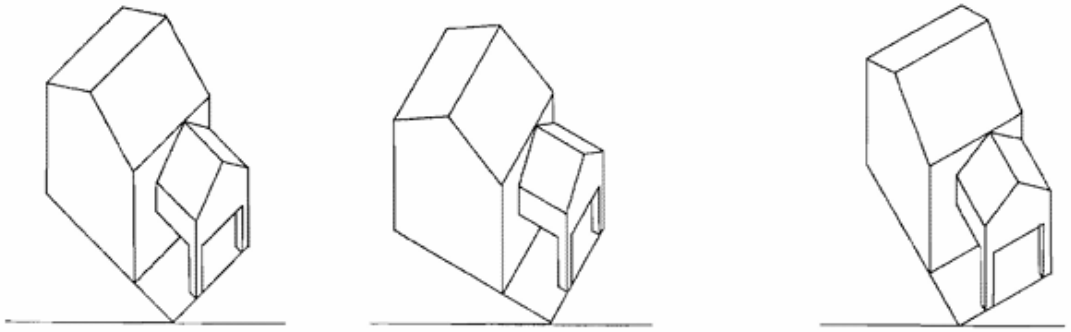
ORTHOGRAPHIC DRAWINGS



ISOMETRIC



PARALINE AXONOMETRICS

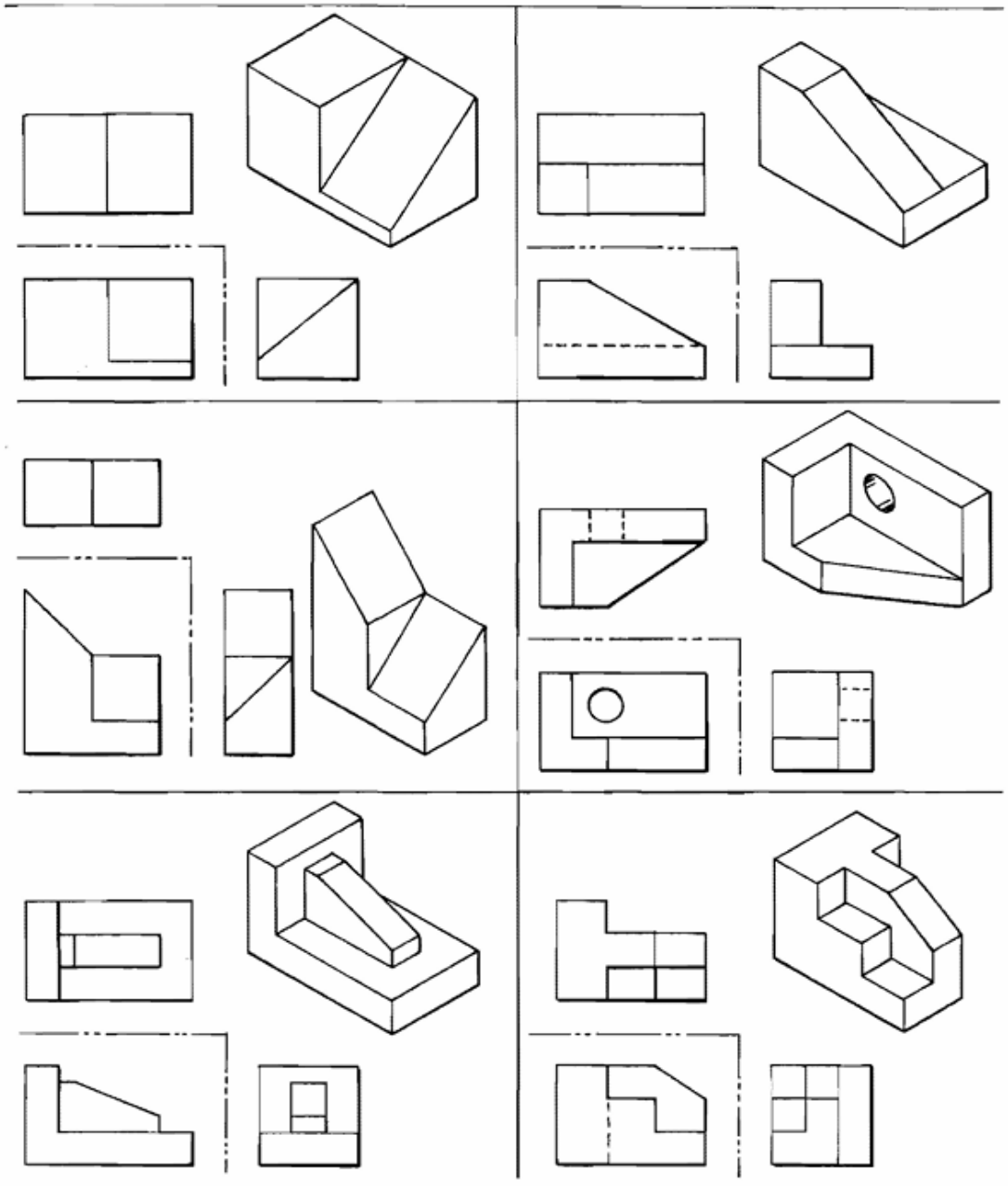


PARALINE OBLIQUES

Plans, elevations, and sections are **orthographic (multiview)** drawings (two-dimensional). In **paraline (single-view)** drawings, sets of lines are infinitely parallel to each other, giving a three-dimensional character to the pictorial. The proper preparation for the study of **orthographic–paraline drawings** consists of a proven proficiency in lettering, line quality, and handling drafting tools. This, coupled with a brief introduction to drawing conventions, provides the essential background for a survey of these types of pictorial drawings. The family of **axonometric** and **oblique** drawings, which includes **isometric** drawings, can all be classified as **paraline** drawings. Paraline axonometrics are also termed **dimetrics** and **trimetrics.**

Rendow Yee, 2007, ARCHITECTURAL DRAWING A Visual Compendium of Types and Methods, Third Edition, John Wiley &Sons, New York, USA

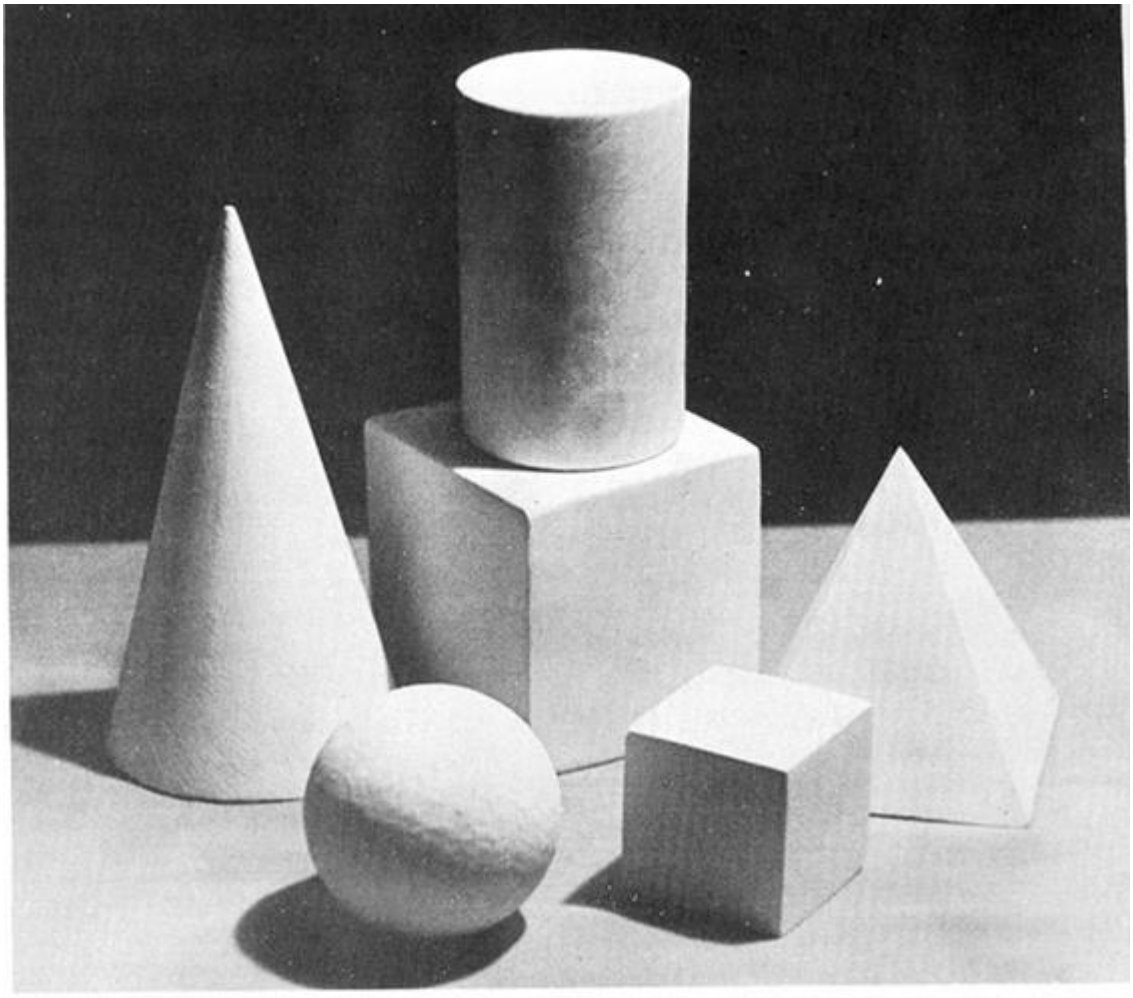
Honing your skills in the visualization of simple block forms will enhance your ability to understand the building forms shown in the latter part of this chapter.

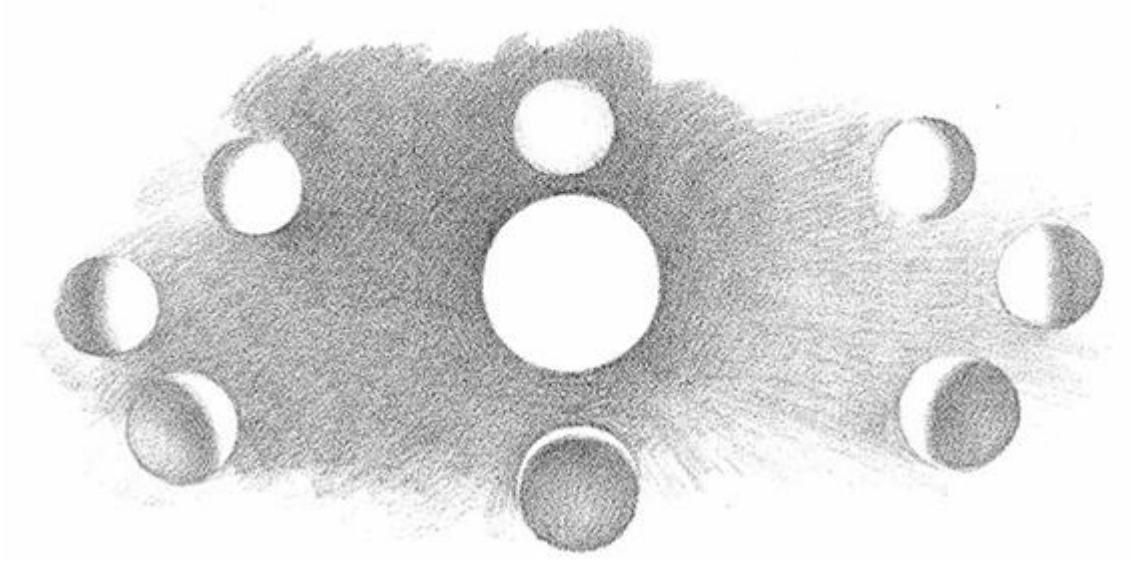


BLOCK VISUALIZATION

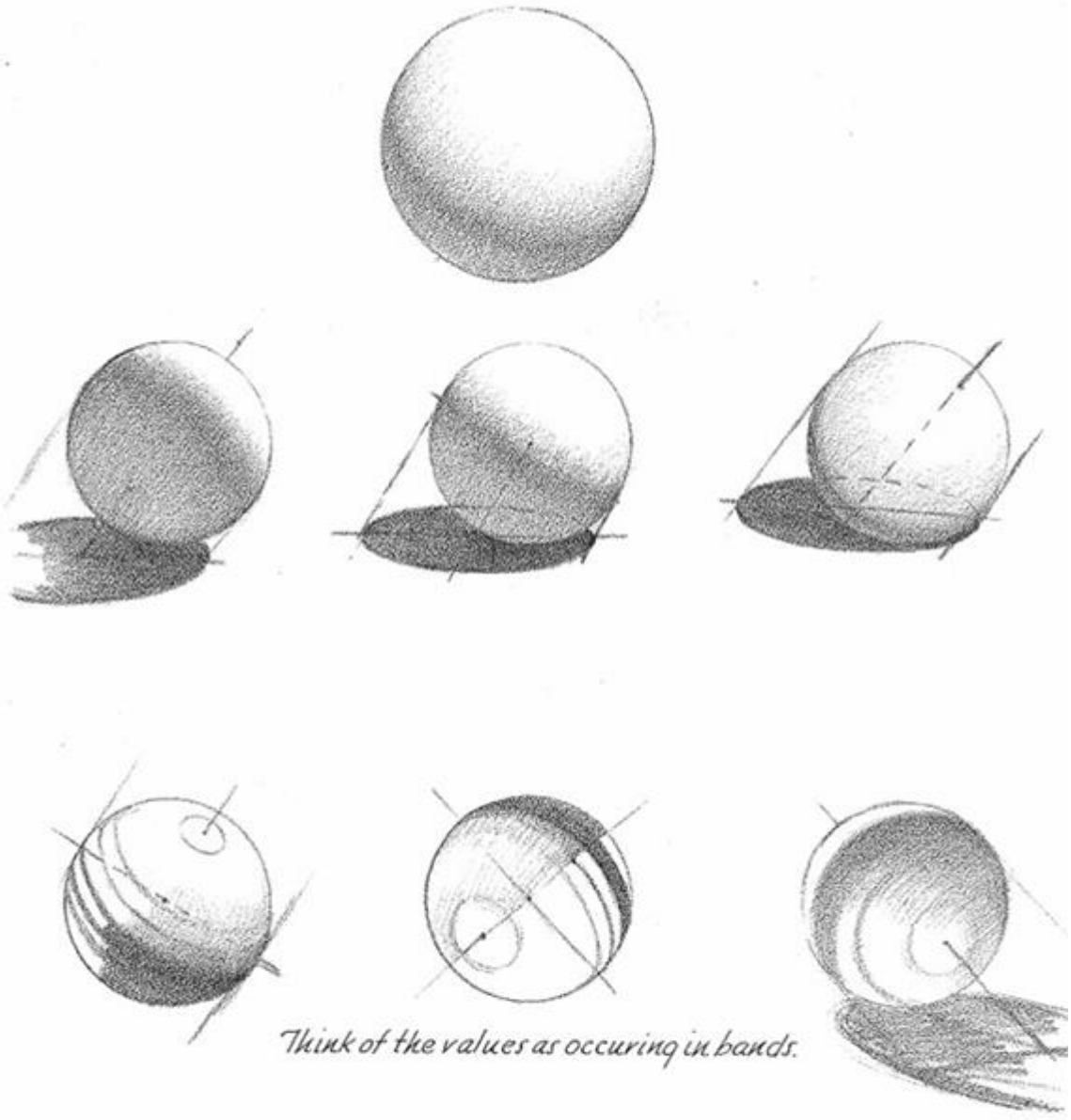
Rendow Yee, 2007, ARCHITECTURAL DRAWING A Visual Compendium of Types and Methods, Third Edition, John Wiley &Sons, New York, USA

Shade and Shadow



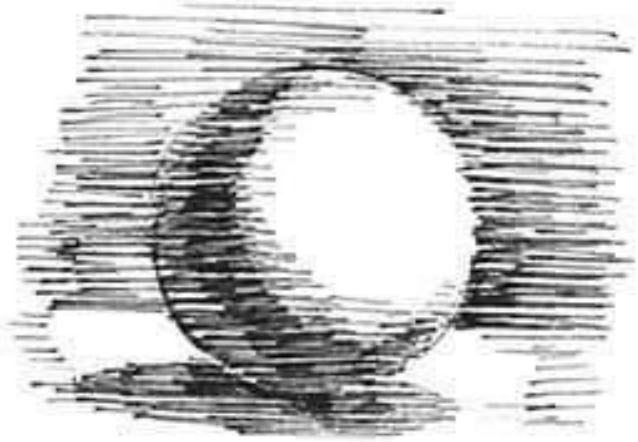


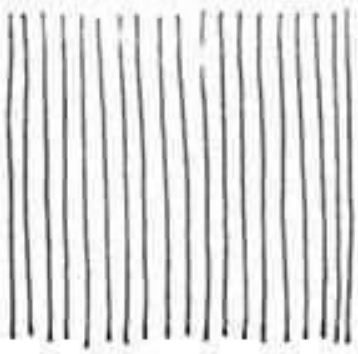
LIGHT ON THE SPHERE

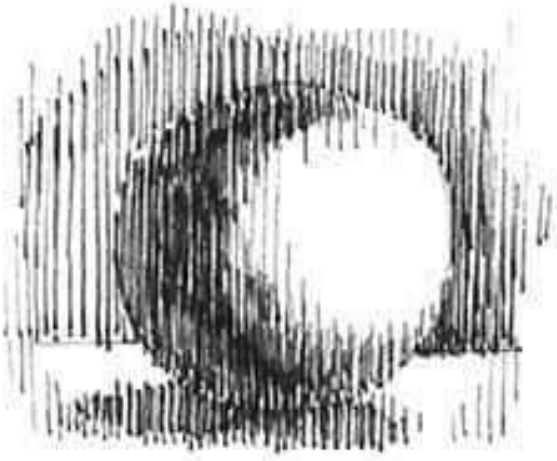


Think of the values as occuring in bands.

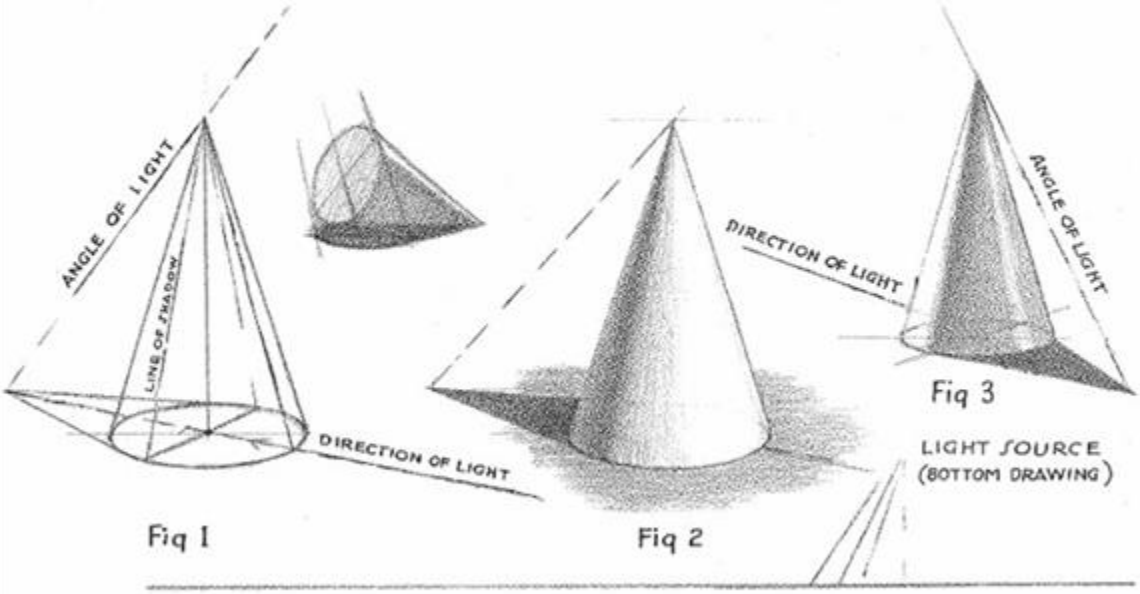
Note the band of darker shadow that appears between the halftone of the light and the reflected light within the shadow. The cast shadow on the ground plane starts from this band

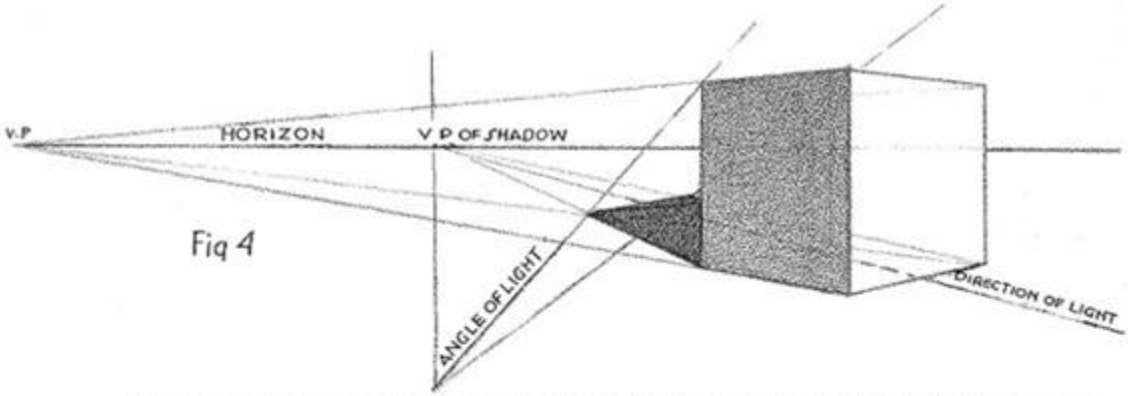


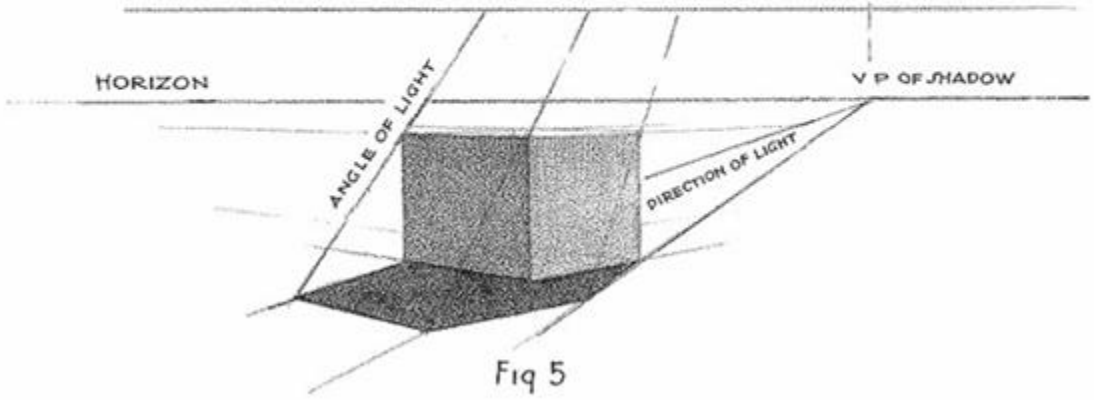




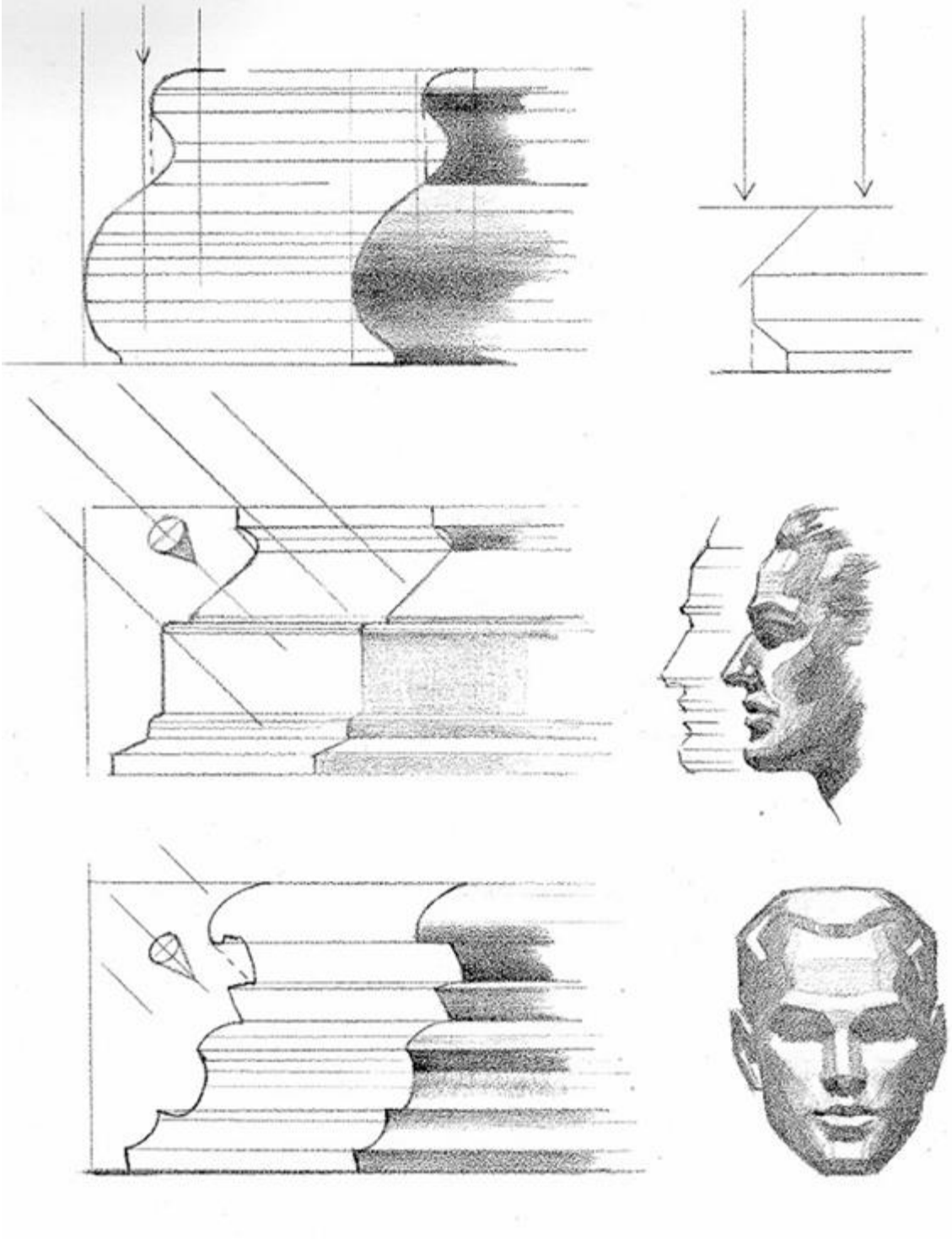
PERSPECTIVE OF SHADOWS



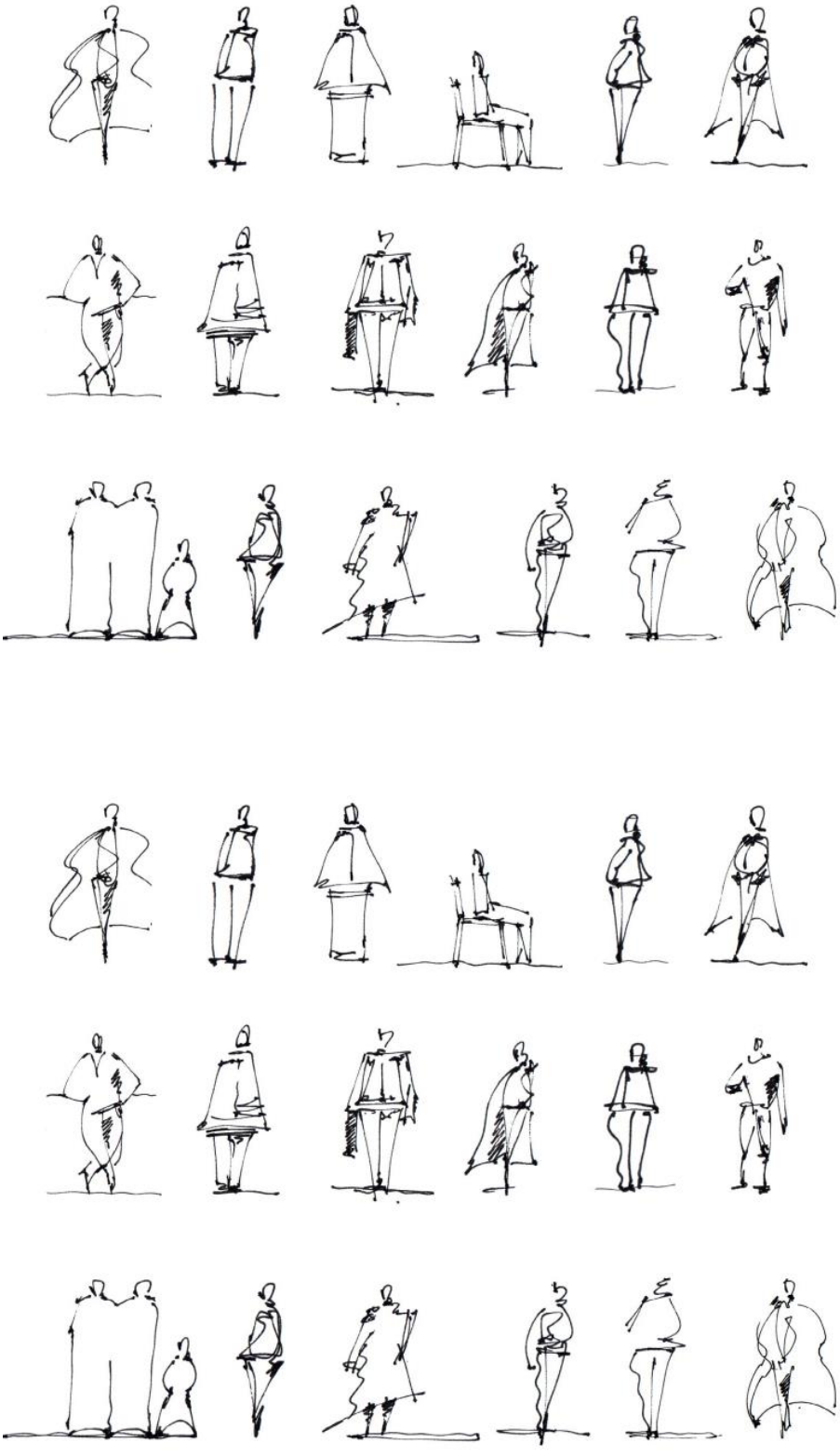




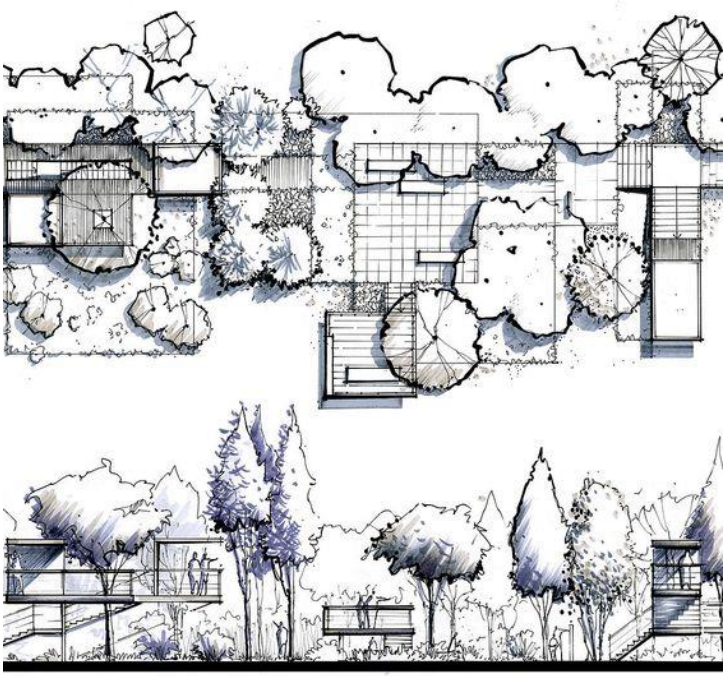
PLANES

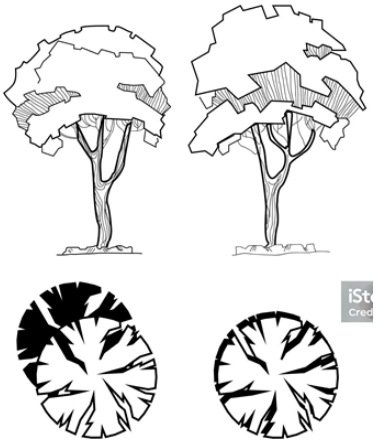


Human Figures



Vegetation





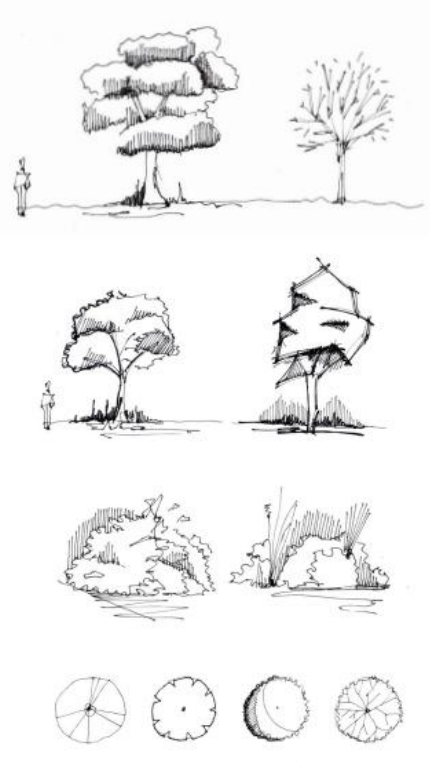
Step 05

Adding Vegetation

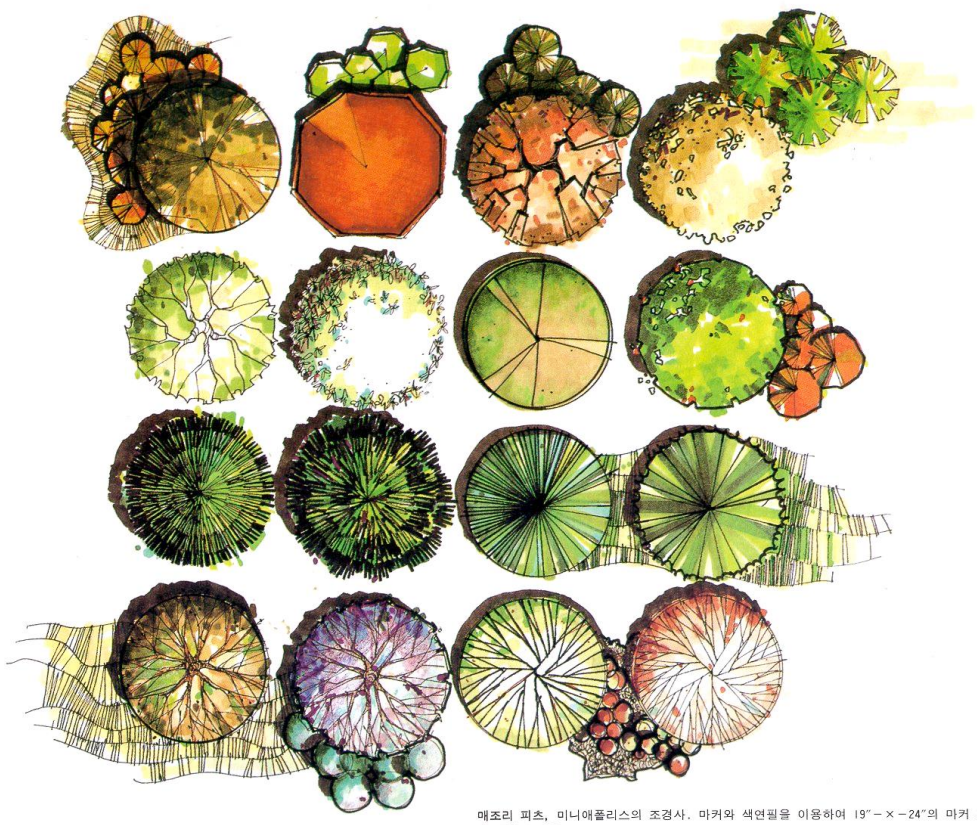
As a final step before putting everything together, we'll take a look at vegetation as an element in architectural sketching.

Natural elements can play an important roles in any visuals. Through combining (very often) boxy architecture with more organic shapes of vegetation, we can achieve a very appealing image. Moreover, vegetation might serve well for defining a setting for our image, for framing the spectator's view, and unveiling the real focal point of an image.

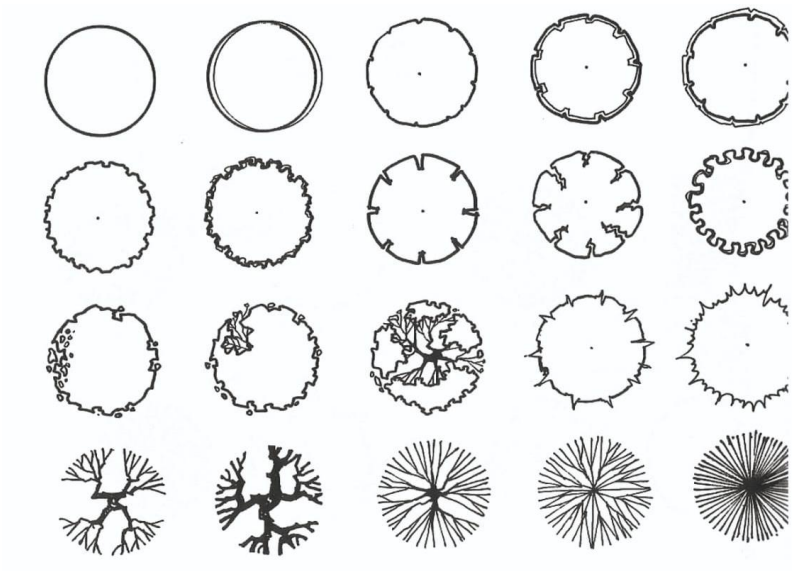
That being said, vegetation is a very powerful and universal element to use in sketches. In this chapter we'll focus on drawing trees, bushes, and grass in different scales and from different angles. Let's dive into it!

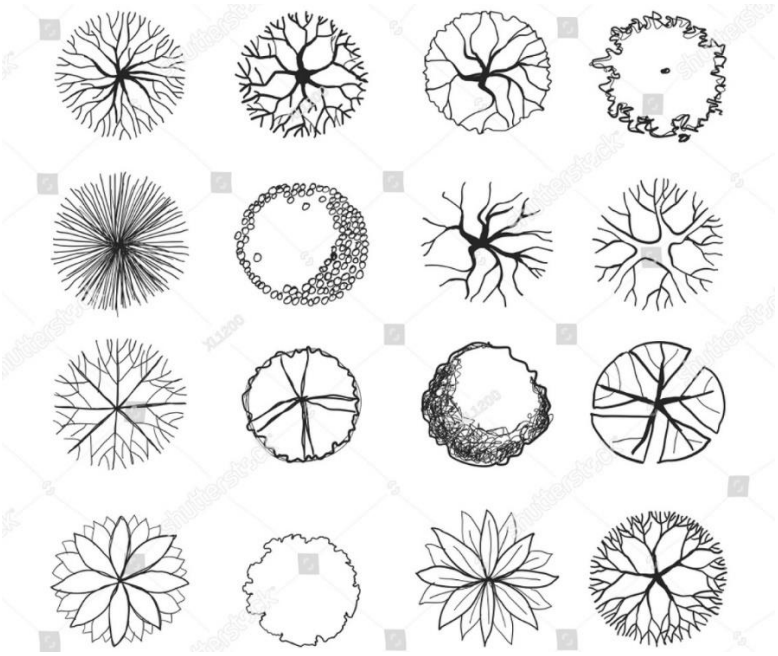


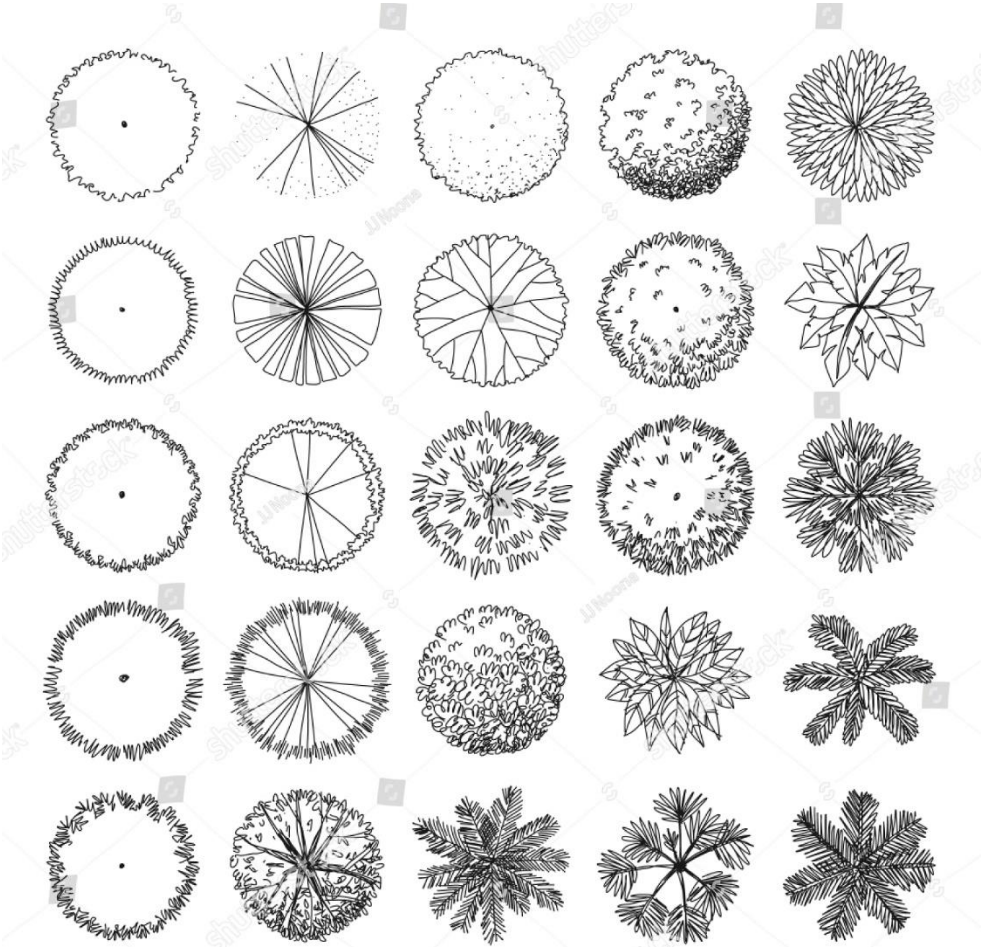
Variations on sketched trees and bushes

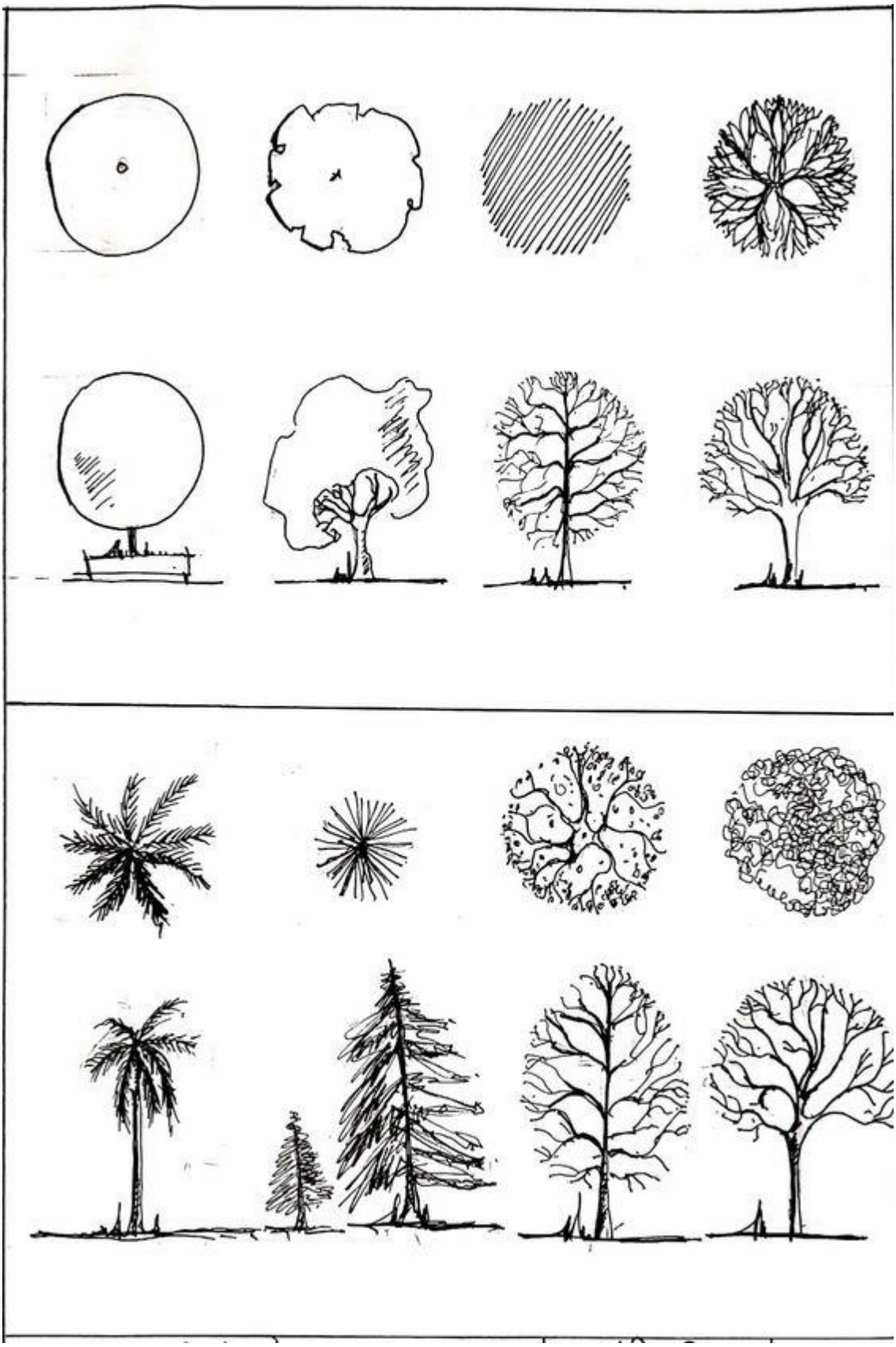


매조리 피츠, 미니애폴리스의 조경사. 마커와 색연필을 이용하여 19″ – × – 24″의 마커 페이퍼에 표현. 4시간









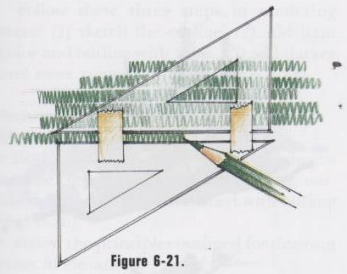


Figure 6-21.

first. These may include round, oval, columnar, irregular, and conical. The outline form alone may be adequate in rough sketches (fig. 6-22).

- Remember to use zig-zag, color pair, and color next principles, and leave some white space. Add dots and finally outline with black.
- Trees behind buildings should be either lighter or darker than the building to create proper contrast.
- Foreground trees should contain the most detail in both the foliage and trunk. Background trees should be shown as simple outlined masses.
- Branching patterns should only be used if elements behind the tree are important to be seen. Trees in full foliage can be used to screen out undesirable views and elements.
- Use concave or convex foliage symbols and letters W or M to show leaf patterns (fig. 6-23).
- Trunks should always be depicted darker directly under the canopy to represent shade and shadow. The overall value of the trunk is highly dependent upon its background. Dark tree trunks should be shown against light backgrounds and vice versa (fig. 6-24).

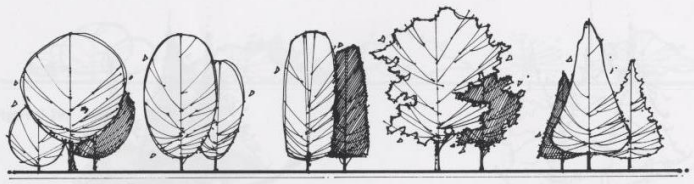


Figure 6-22.

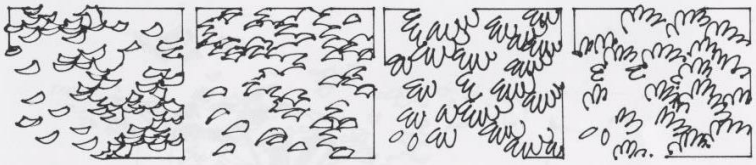


Figure 6-23.

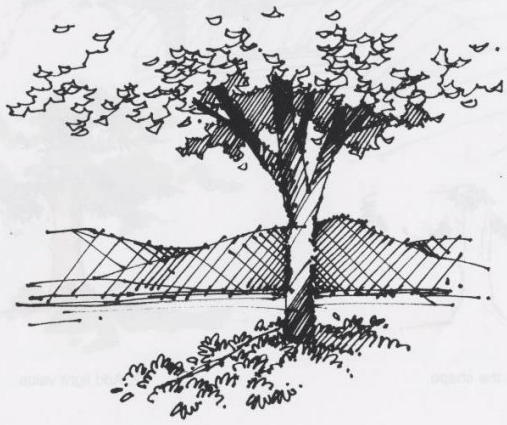
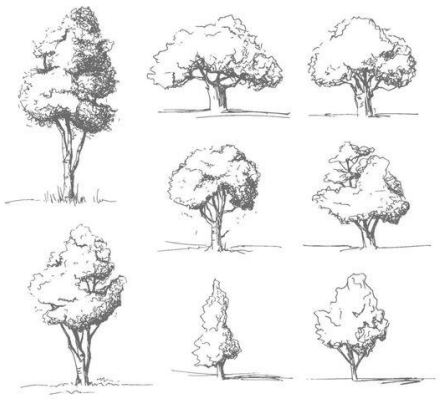


Figure 6-24.



One Point Perspective

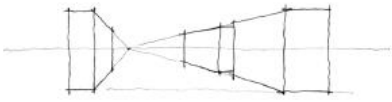
Step 02

Basic Perspective Rules

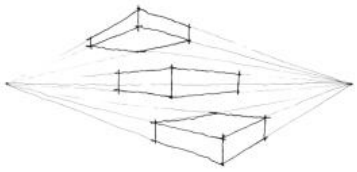
The way we see the world is driven by rules of perspective - both linear and atmospheric. In this chapter we'll take a look at one point and two point linear perspective as it will lay the foundation for our architectural sketches.

The important thing about perspective is to realize that it is applied everywhere, literally everywhere. Everything we draw, from an apple to a spaceship, needs to follow the rules of perspective in order to look realistic. **The perspective works like an invisible grid helping to place objects in our spatial composition. It is a way how to describe 3-dimensional space on a 2D plane.**

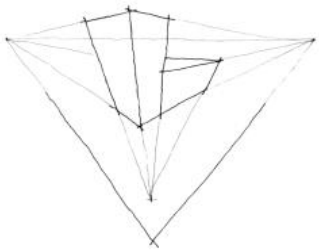
There is no reason to be scared of perspective drawing, it doesn't always require a ruler or math knowledge to handle it. By following just a couple of simple rules, you'll be able to express your spatial ideas through sketching in perspective. Let's dive into it!



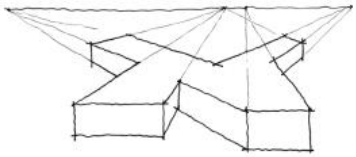
1-point perspective



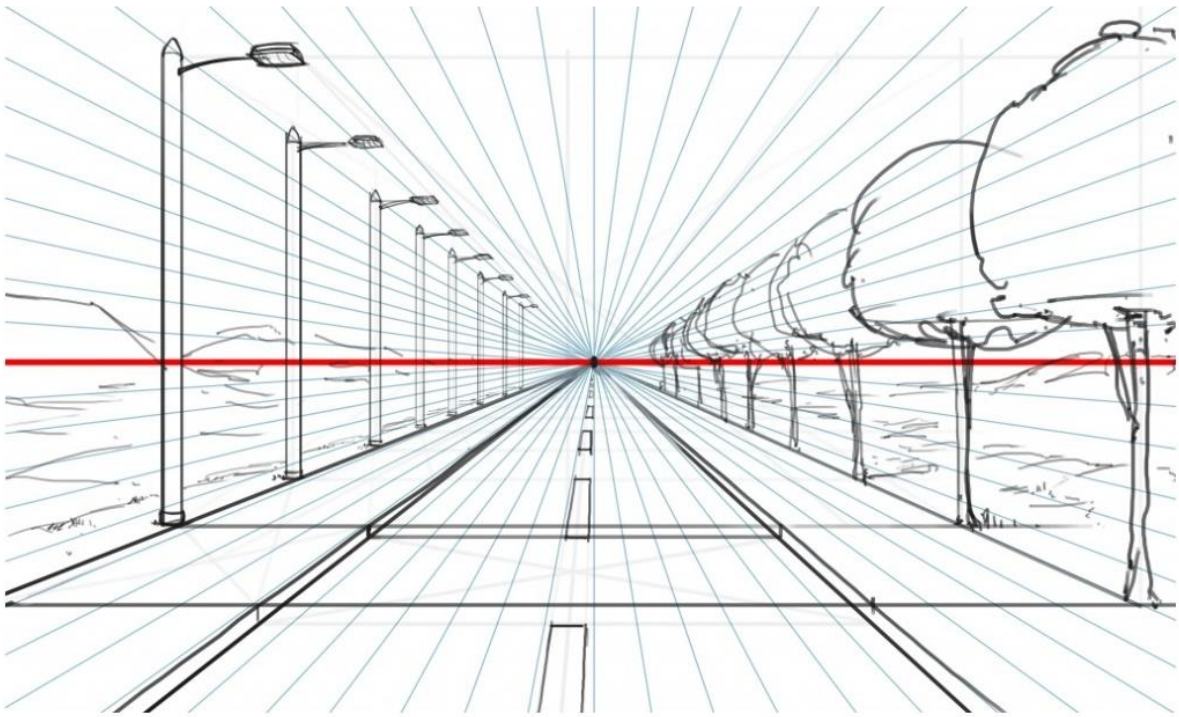
2-point perspective

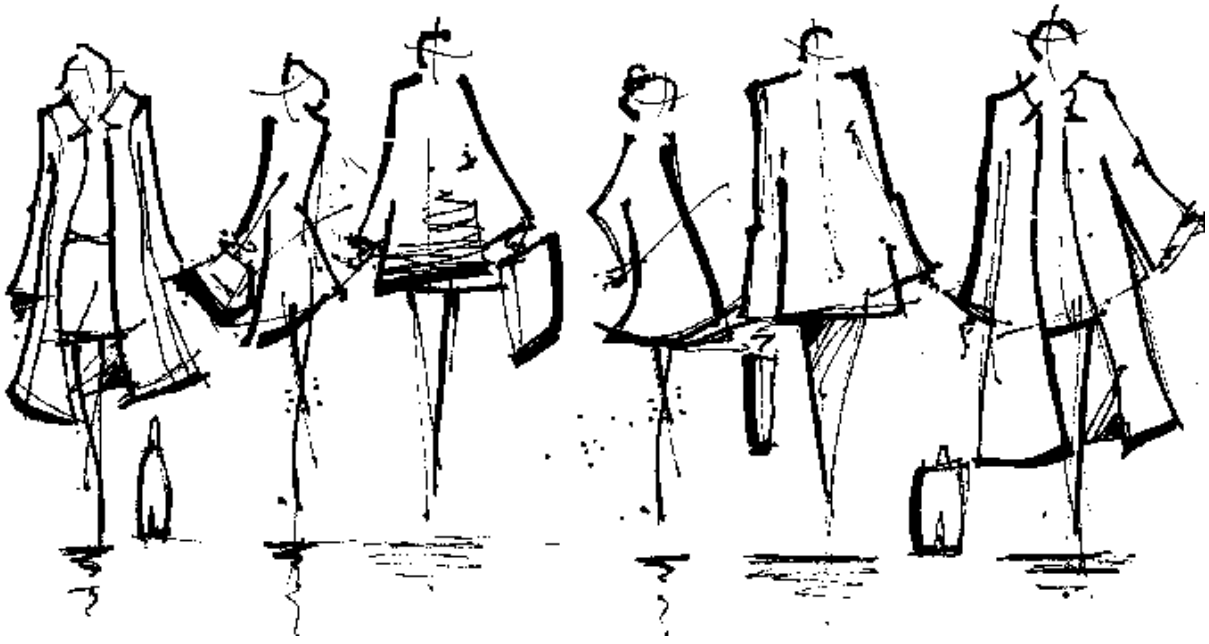


3-point perspective



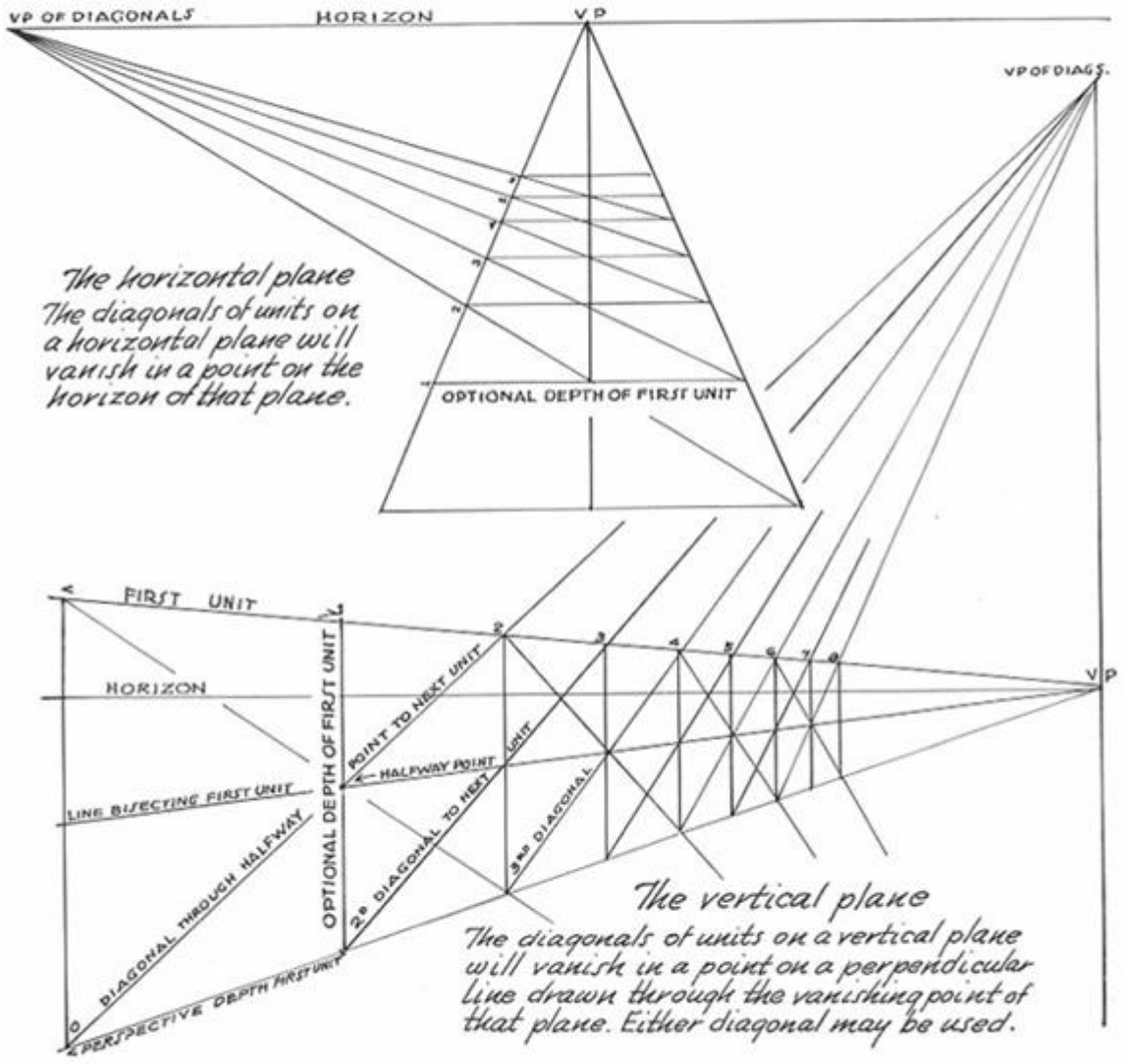
Multi-point perspective





MEASURING DEPTH BY MEANS OF DIAGONALS

The drawings below show how to space off equal units in perspective within both horizontal and vertical planes. This is valuable in drawing evenly spaced units that recede toward the horizon. It will enable you to space correctly such things as units of rug designs, fence posts, telephone poles, trains, window panes, blocks in sidewalks, building blocks, bricks, roofing, wallpapers, etc.



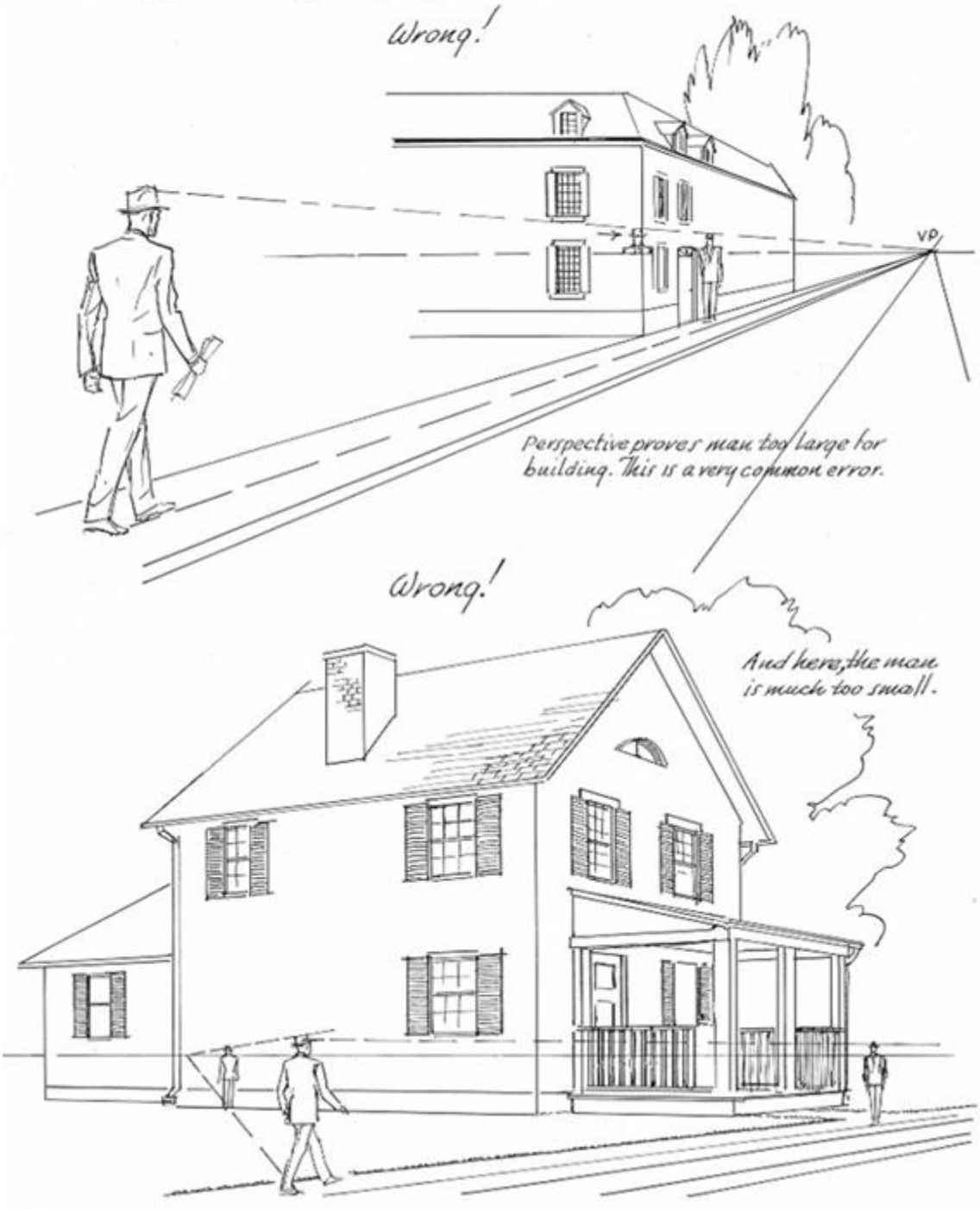
The horizontal plane
The diagonals of units on a horizontal plane will vanish in a point on the horizon of that plane.

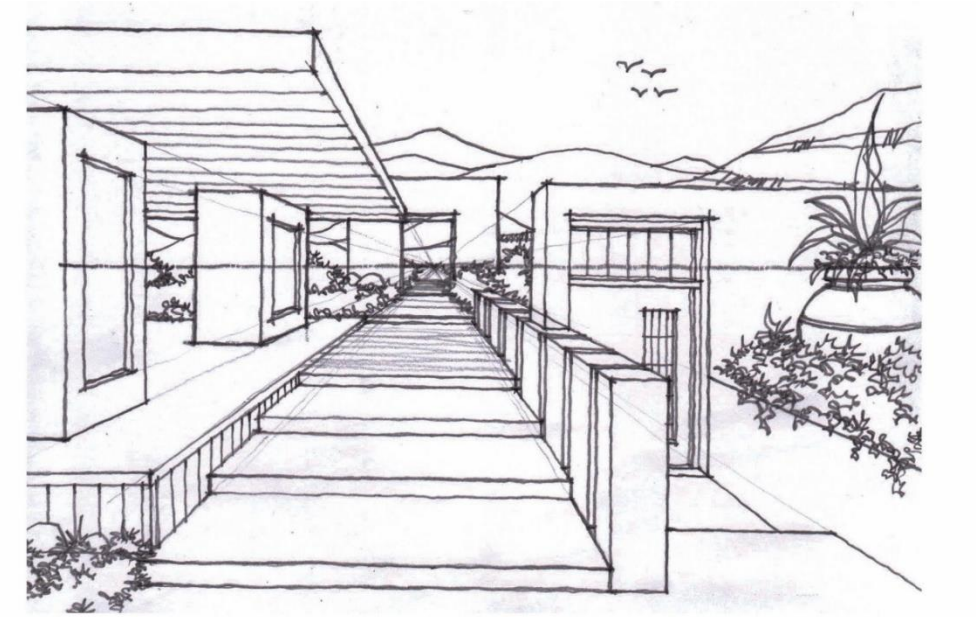
The vertical plane
The diagonals of units on a vertical plane will vanish in a point on a perpendicular line drawn through the vanishing point of that plane. Either diagonal may be used.

In any perspective drawing we must set the perspective depth of a first unit, because it's appearance is affected by the distance from which we are viewing it. It's perspective depth changes with every step we take toward or away from such a unit or area. When the first unit is established, we repeat it by running a diagonal through a halfway point of the unit to either the top line or the baseline. This marks off the next unit, as 0 through 1 to 2, 2 to 3, etc.

PROJECTION OF FIGURES

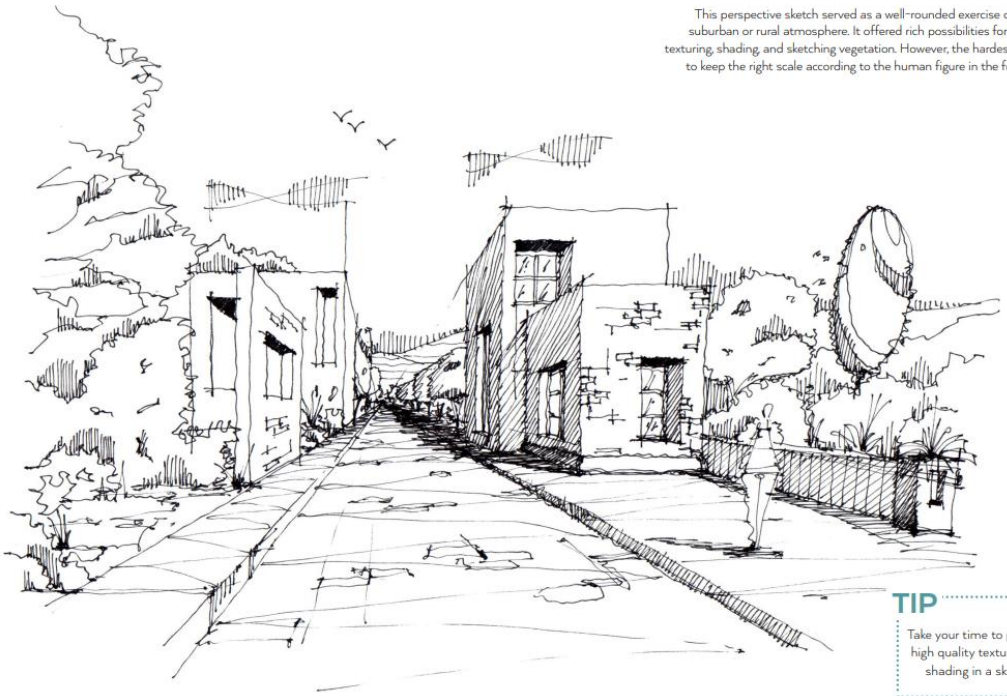
When it is so easy to scale a figure to any spot on the ground plane, such errors as those shown below are unforgivable. If the feet of a figure do not show, any portion of a figure may be projected, as, for example, the head and shoulders of the man in the drawing below. Remember always to scale your figures. Don't guess – you can't.





1-Point Perspective
Inspired by the work of Ruzaimi Mat Rani

This perspective sketch served as a well-rounded exercise depicting a suburban or rural atmosphere. It offered rich possibilities for practicing texturing, shading, and sketching vegetation. However, the hardest task was to keep the right scale according to the human figure in the foreground.



TIP

Take your time to produce high quality textures and shading in a sketch.

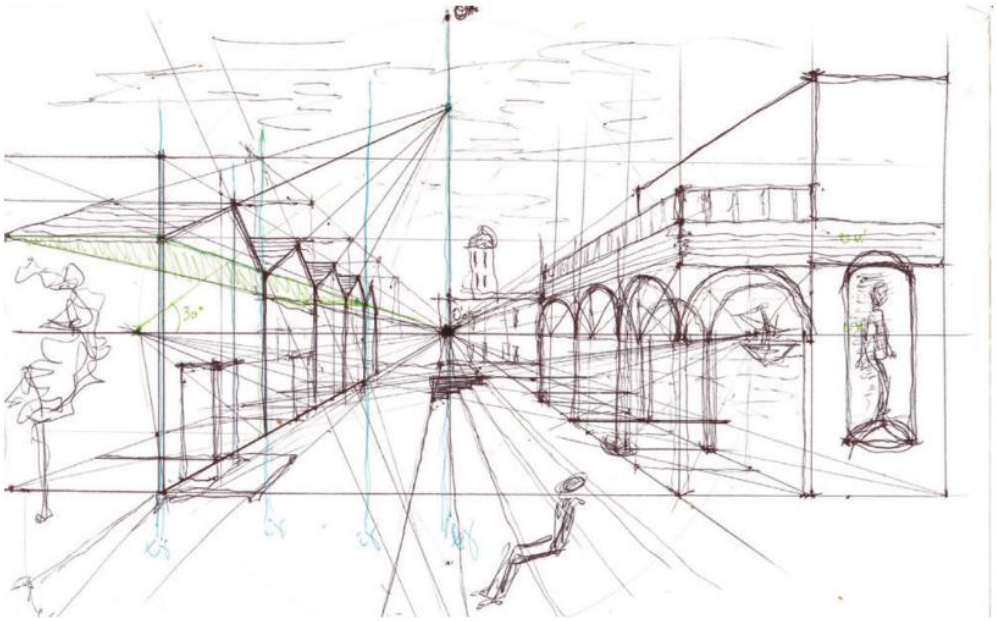
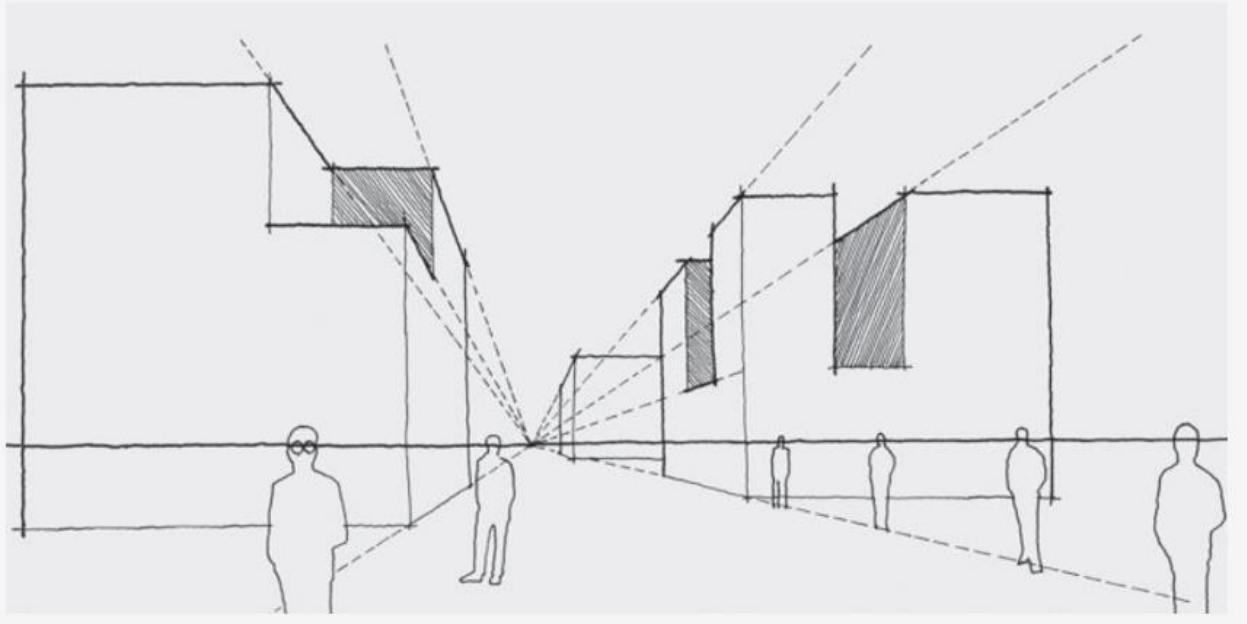
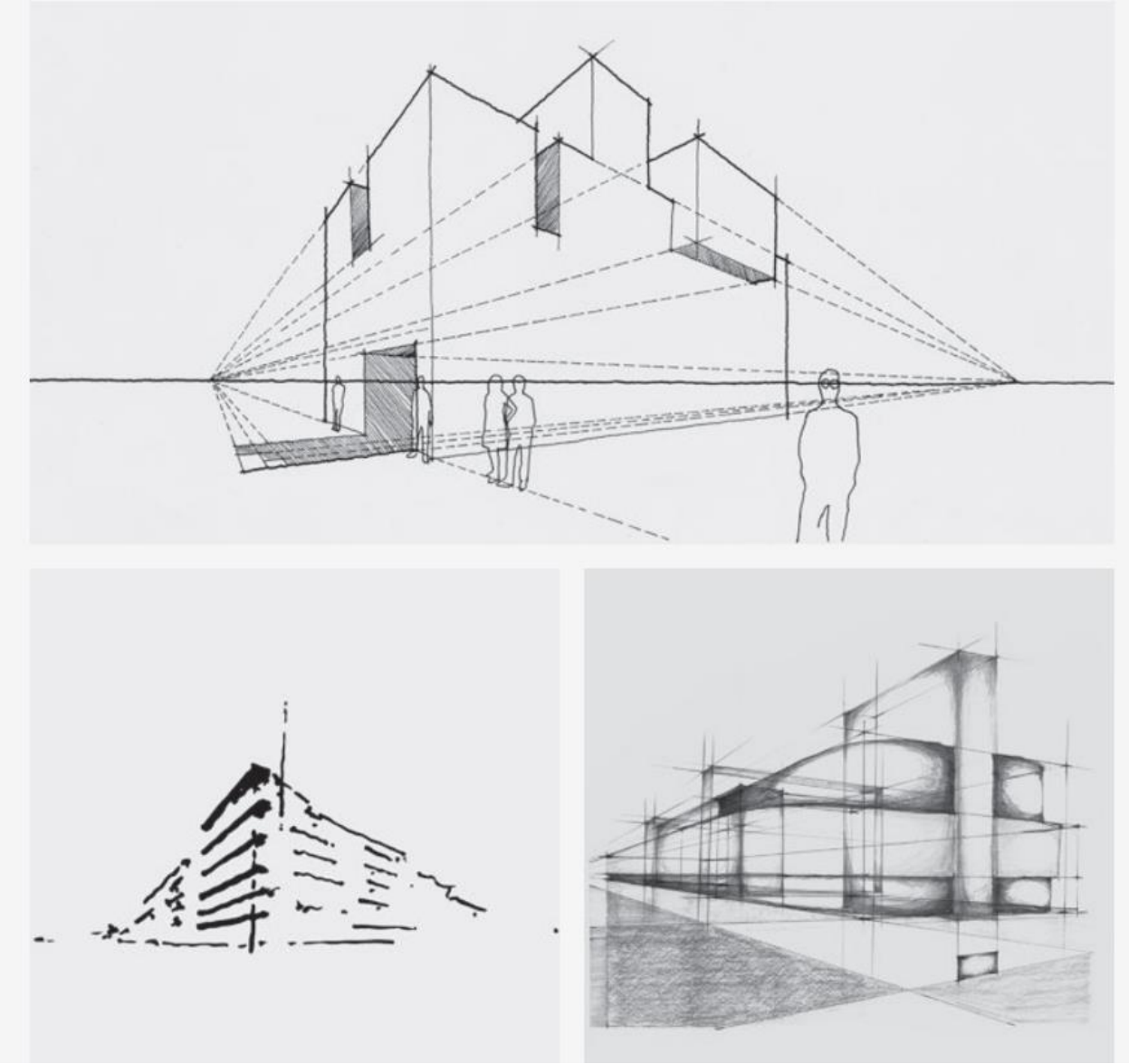


Fig. 3. Perspective construction.
Sketch with geometric studies.
Drawing by F. P.



Two Point Perspective



Eric J. Jenkins, 2013 Drawn to Design Analyzing Architecture Through Freehand Drawing,

Birkhäuser, Germany

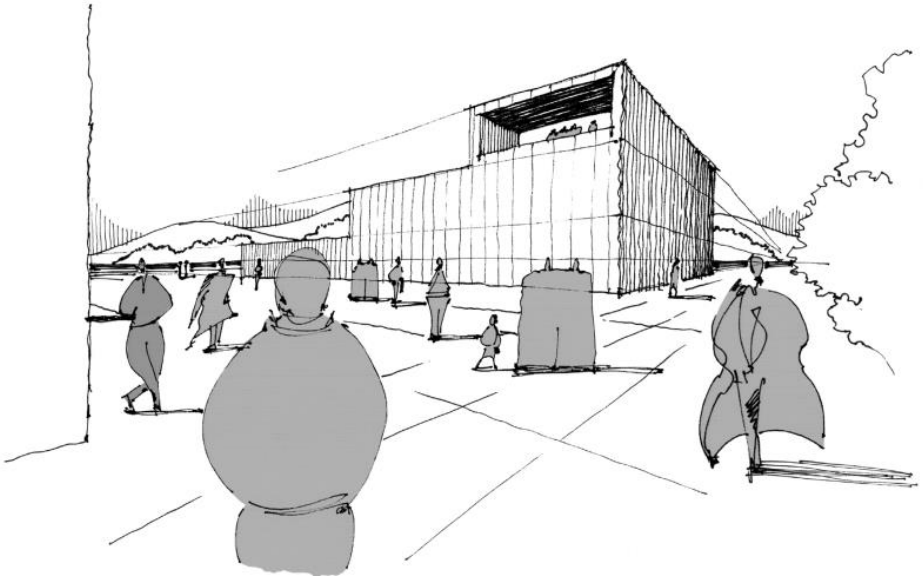
Exercise

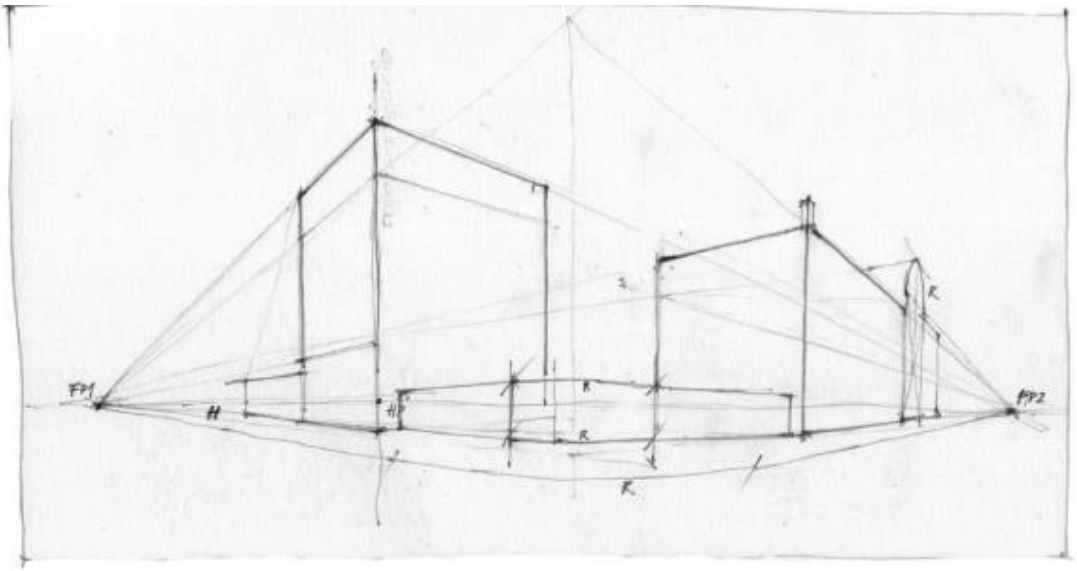
Your Exercise for practicing populating your sketch is to **sketch a composition of human figures in an eye-level perspective.**

For start, you can suggest a simple spatial setting in an eye-level perspective to put your figures into. In the example on the right hand side, I chose to sketch a space evoking a public plaza, so a number of differently distributed people would feel natural in there.

When you're done outlining the spatial setting, add 10 to 15 figures in various depth layers to your sketch. The rule number one for populating your eye-level perspective sketch is to keep every figure's head on the horizon. We assume that all of them would be the same height (except for children or sitting people).

Also keep in mind the composition of an image. Note, for example, how the main building is graphically balanced with the closest figure in the foreground.

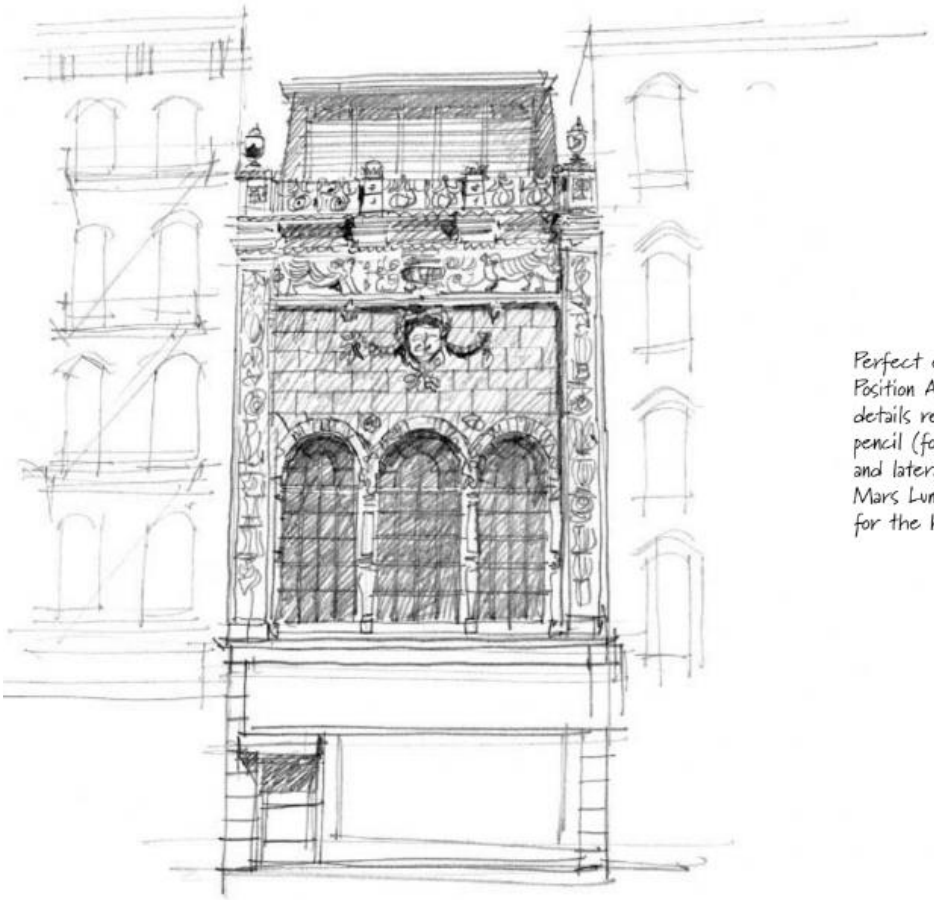



FP1
H
FP2


FP1
H
FP2


FP1
FP2

Quick sketch using 3H pencil on sketching vellum. The soft pencil and the fine tooth of the vellum surface are perfect partners in sketching. (Portofino, Italy)



Lower Manhattan, New York; H pencil

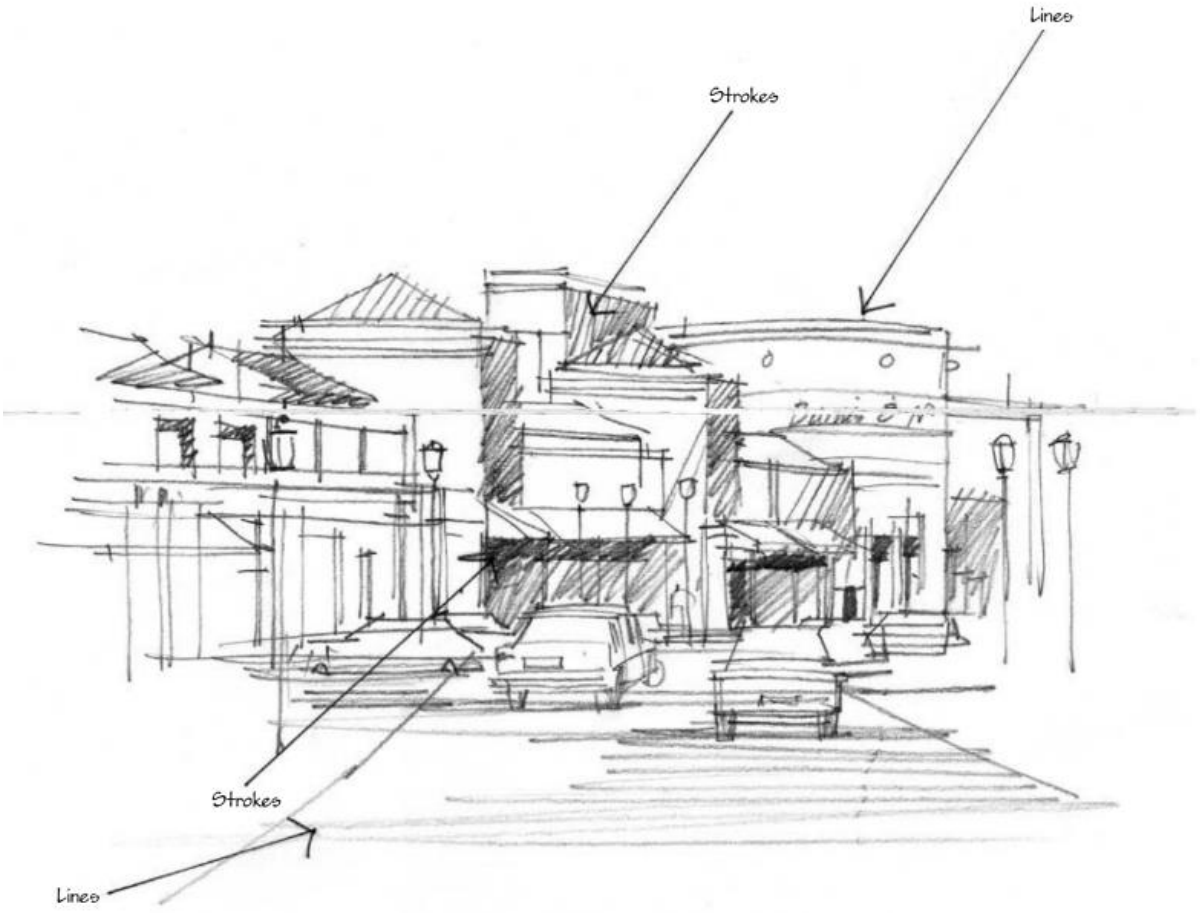
Perfect example of sketching in Position A. Focusing on architectural details requires a tight grip of the pencil (for better control). Down/up and lateral movement is minimal. Mars Lumograph H pencil was chosen for the hard lead.

3H pencil

and knowing how hard to press the lead is something which novices dream about. It takes time and devotion, and there are certainly no shortcuts on this journey of learning and experiencing.

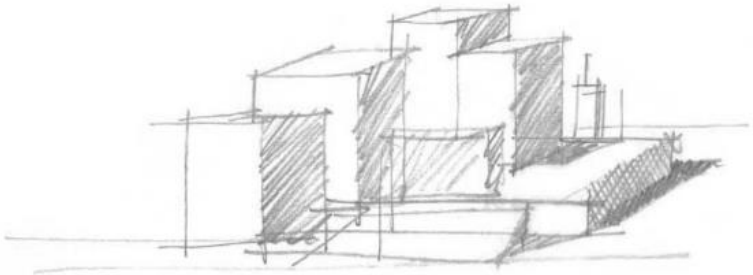
. . . Time to return from getting too philosophical and Zen-like. There *are* actually a few tricks one can learn in the exploration of pressure and force. The key here lies in the grip. Since pressure emanates from the fingertips, the grip and the contact between the fingers and pencils are extremely crucial. For example, using the Position B grip, when the thumb is the only finger that exerts the force, the third finger becomes the receiving side and must offer some form of resistance. This knowledge *can* be taught and learned. The amount of resistance is the key in determining the value of the shading. A darker value is due to less resistance and vice versa. To alter and vary the value of the pencil shading depends entirely on the artist's ability to press and lift at the appropriate moment. Unlike learning how to hold the pencil, this is not something that can be quickly taught, but it must be practiced over time.

I hope this helps to clarify what I said earlier about the personal and intimate experience of sketching. Yes, pencil is the easiest sketching practice to learn. But it is nevertheless a very hard practice to master because of the nature of the material. Still, this should not keep you away from learning how to sketch with a pencil. On the contrary, I hope that this quality will attract you to the medium.


Lines
Strokes
Strokes
Lines

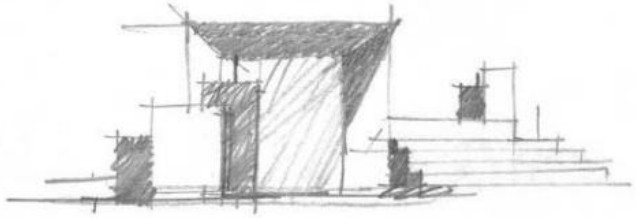
Bandstand in Zanzibar, Tanzania; H pencil

34

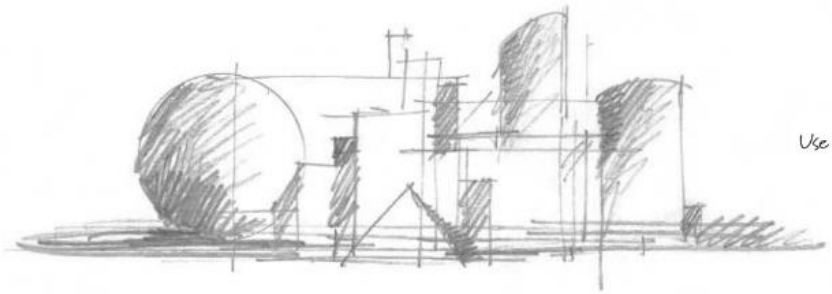


TEXTURES AND PURPOSES

Use texture to separate planes and explain the three-dimensional quality of the object.



Use texture to explain the sun/shade relationship.



Use texture to help describe the shapes.

Fig. 21: Tchoban Foundation, Museum for Architectural Drawing, Berlin

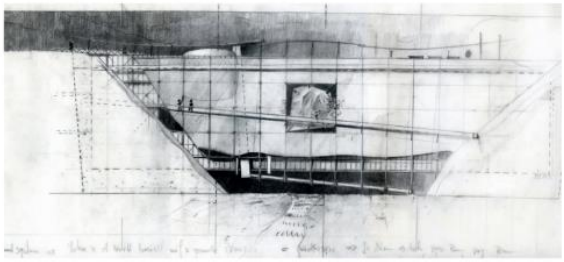
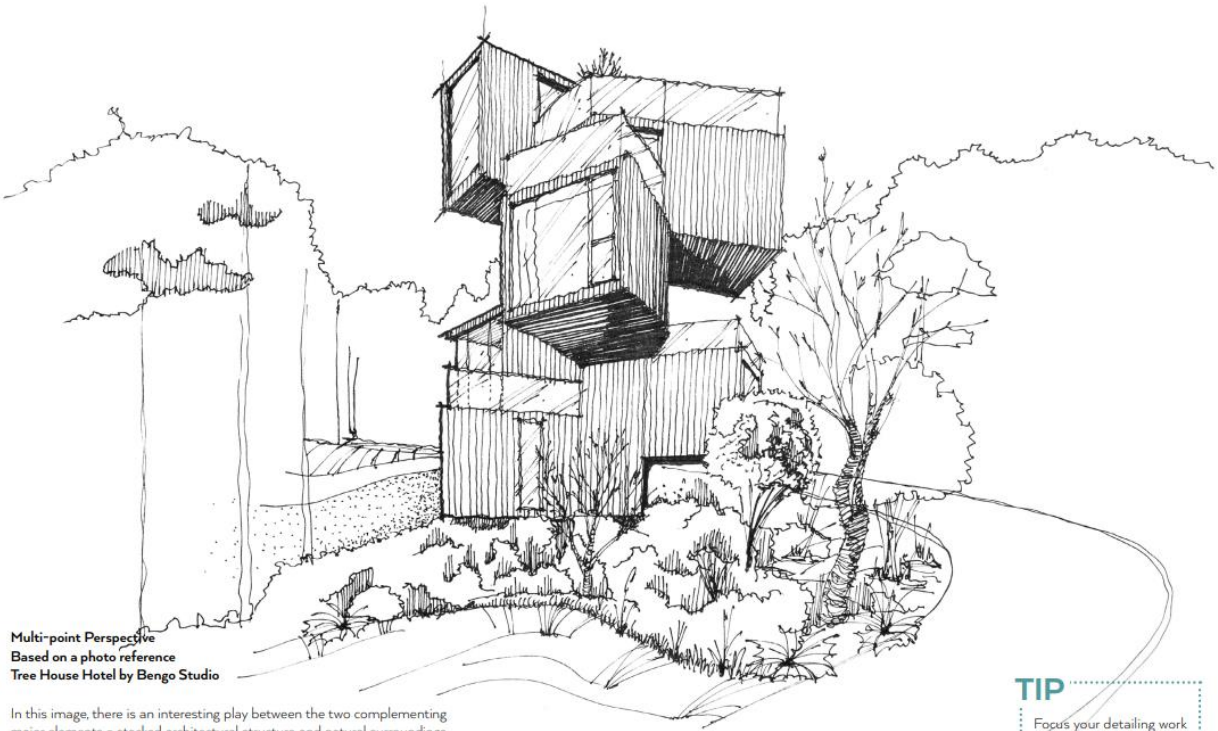


Fig. 22: Design for a weather station



Multi-point Perspective
Based on a photo reference
Tree House Hotel by Bengo Studio

In this image, there is an interesting play between the two complementing major elements - stacked architectural structure and natural surroundings. The central part of the image is most detailed and therefore it draws the most attention. The focus is on the hotel itself, its role within the nature, and the contact with the closest vegetation.

TIP

Focus your detailing work only on the areas which matter to the image.


Kaufmann, Sr. Residence, "Fallingwater"

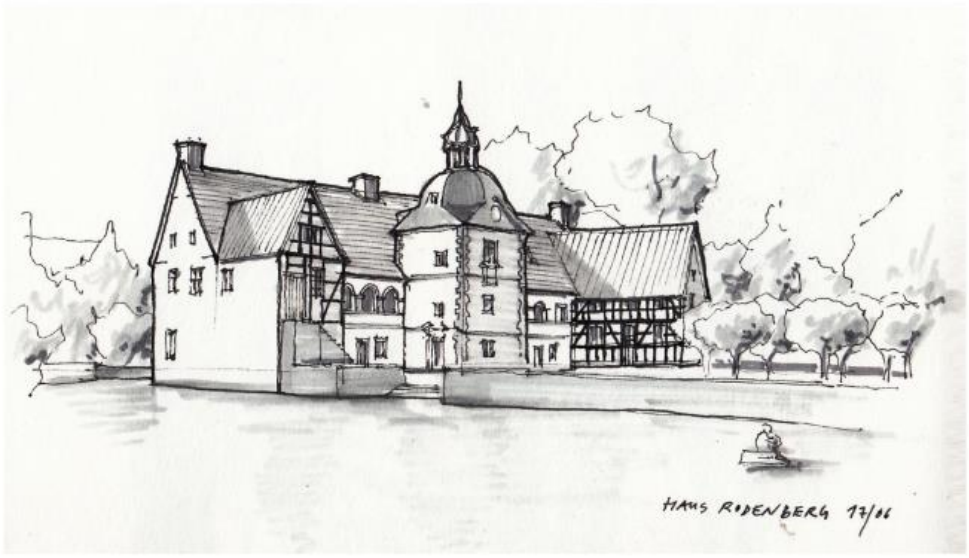


Fig. 25: Ink pigment drawing using different line thicknesses to emphasise the volumes of the building, felt pens used to indicate shadow

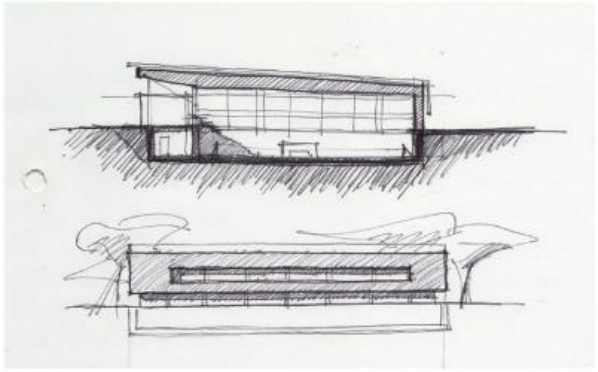


Fig. 26: Design drawing (section and elevation) made with a ballpoint pen

Florian Afflerbach, 2014, Basics Freehand Drawing, Birkhäuser

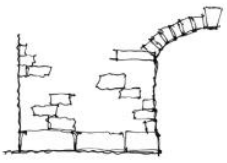
Textures & Materiality

Now we are going to use the rendering techniques mentioned before to create suggestive textures expressing materiality in our objects.

In these examples you can see the most common materials which we depict in architectural sketches.

Some of the textures, e.g. stone or timber, might be used for different elements in a space, such as walls, floors/roads, beams etc. That being said, we should always try to adjust these textures so they fit their context – by means of correct perspective and the level of detail.

STONE

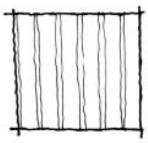


Stone wall

Stones by the road

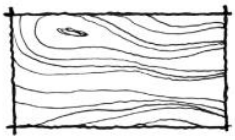
Stone road

TIMBER



Wooden planks (facade)

Wood section (beam)

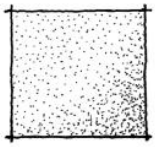


Wood texture (floor)

BRICK & CONCRETE

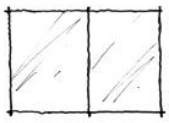
Brick texture (detailed)

Brick wall



Concrete texture

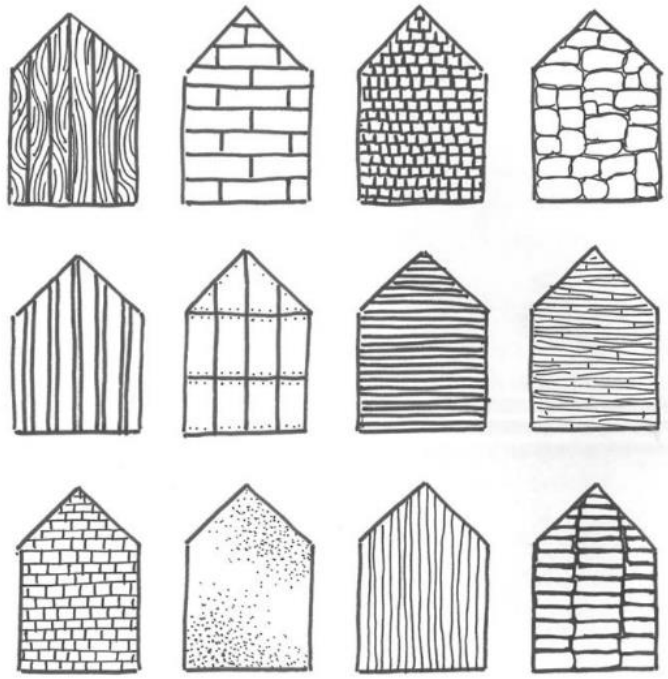
GLASS



Window reflections

BUILDING MATERIALS

Rendering the materials of a building adds another level of information to an architectural sketch. This exercise provides initial practice representing common materials used in the exterior of buildings, such as wood, stone, and concrete. These materials are then applied in context, to a multi-gabled house.



1.

Draw 12 squares (or the outline of a simple house, as seen here). Render each shape with a different building material. Use the materials in this example or create your own. Alternate between your medium and thin pens, exploring how the different pens change the representation of the material. Materials rendered with a thin pen are more subtle and do not distract from the form of the building, but there may be instances when you want the material to read more dominantly, in which case you would use a medium or thick pen.

The renderings in this example represent:

(top) textured wood; smooth stone; wood shingles; rough stone

(center) clapboard wood; concrete; wood, metal, or vinyl; wood strips of varied length

(bottom) brick; stucco; corrugated aluminum; uneven stone

2.

Select a building Study and draw your building as a line drawing.

3.

Render each element of your building using a different building material.

4.

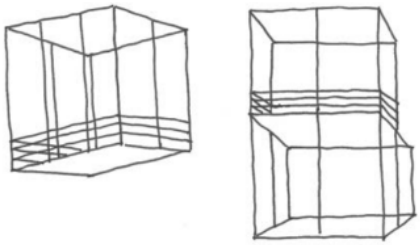
Draw your building and render it in the actual building material used.

BUILDING SPECIFICATION

Fletcher House
Hugh Newell Jacobsen | Nashville, Tennessee, USA | 2003

BUILDING LAYERS

Previously we have used the term layering to refer to the overlapping elements in a perspective sketch. In this exercise we will take layering more literally, and peel back the actual physical layers of a building. By understanding the different components that make up the exterior of a building and studying them as unique architectural elements, you will gain a better understanding of the building as a whole.

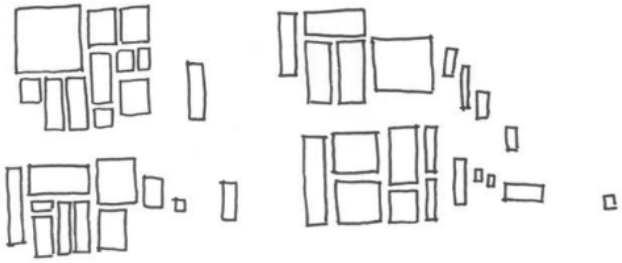


1.

Select a building Draw the outermost layer of the building you select. In this example the thin framework that creates the structure and handrails of the porch/balcony at the rear of the house are expressed first.

2.

Peeling away the layer previously sketched, draw the next layer. The abstract arrangement of the multi-size windows is shown.

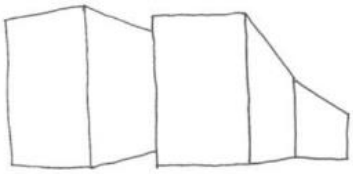


3.

Create a sketch of the next layer—in this example, the horizontal siding that covers the building.

4.

After your layers are peeled away, you will be left with the basic form of your building. Draw this form.



5.

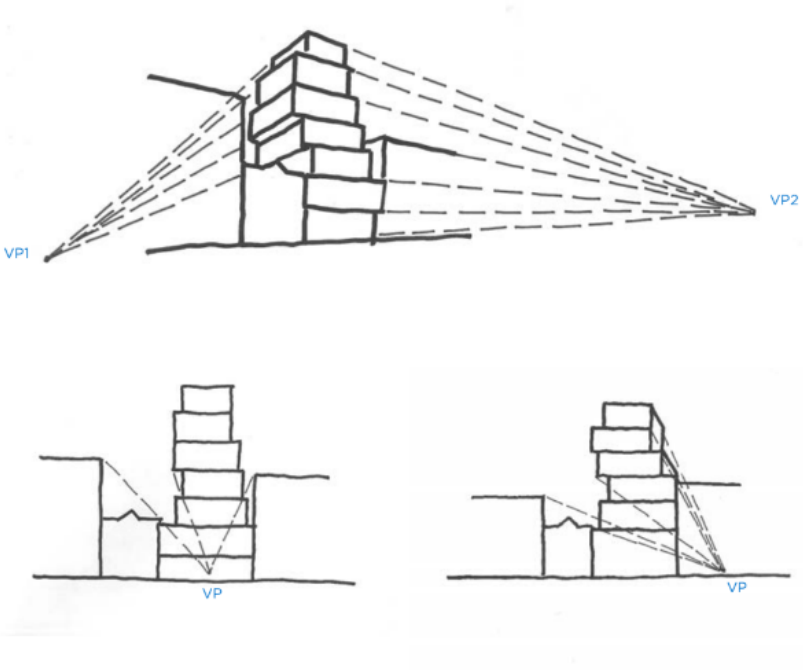
Now that you have a deeper understanding of the layers of your building, draw your building in its entirety. If you are working in ink (and will not be able to erase), begin with the layer that is closest to you and sketch the layers in the order that they recede.

BUILDING SPECIFICATION

Y House
Steven Holl | Catskills, New York, USA | 1999

LEFT-TO-RIGHT PERSPECTIVE

In the Furniture + Lighting and Interiors sections, we explored perspective—including the idea that all elements within a view that fall along an orthogonal line recede to a VP. This is nowhere more evident than in architecture, where the larger scale allows you to understand this principle in a more profound way. If you view a building while walking from one end of a street to the other end, you will slowly see the perspective change and the VPs shift from the side of the building to behind the building, and to the other side. This exercise examines these subtle changes and records three points along your path. In this example the abstracted block forms of the architecture create interesting geometric views at each designated point.

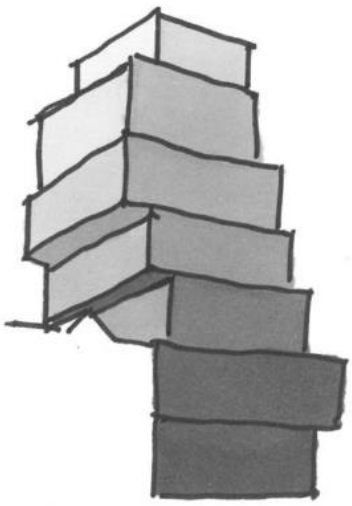


1.

Select a building that you can view from three points Start with the first point along your path. Indicate your VPs, and dash the lines that radiate out from the VPs to your building and surrounding buildings (if applicable). Sketch the basic forms of your building using your thick pen. Repeat with two other points along your path.

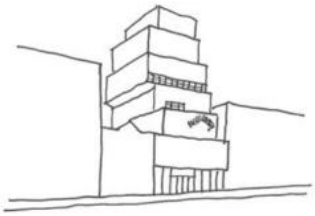
2.

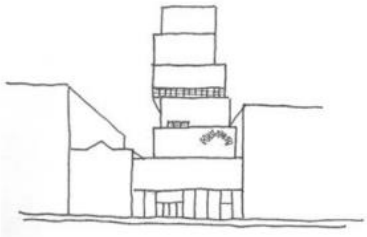
Select one of your views to render with markers, showing the elements closer to the ground (and the viewer) darker, and the elements as they recede from the viewer lighter. While many of the interior perspectives we have created recede into the distance horizontally, tall urban buildings recede into the distance vertically. Depending on the location of the viewer and height of the building, some buildings will also recede toward a VP above the building; this is the third point in a three-point perspective, which we will explore in the Multi-point Perspective exercise (see page 106). Here we will just use the gray values to produce the faded or ombré effect of a tall building receding up toward the sky.



3.

Complete a final sketch for each view along your path. In this example details such as signage/artwork and taxicabs give identity and a metropolitan frame of reference.



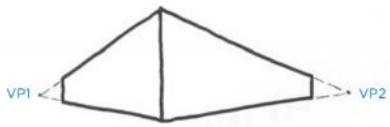


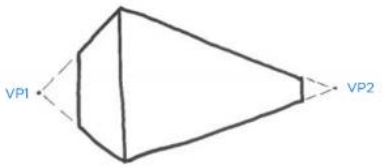
BUILDING CURVES

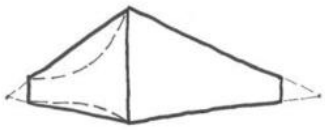
Sketching a building with curved elements requires the same basic approach you would use for a rectilinear building, but with a few additional tools. These structures evoke movement and fluidity, and your sketch should reflect that. This exercise builds upon the perspective methodology that we have previously studied. The two buildings chosen for this example highlight different aspects of portraying architectural curves.

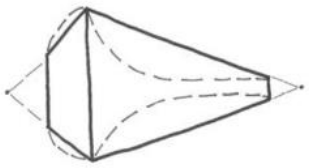
1.

Select a building with curved elevation(s) With your thick pen, draw your buildings from a two-point perspective (looking at the corner). At this stage treat the buildings as if they were rectilinear. Indicate and note your VPs with dashed lines that extend from the solid lines of your building outlines.







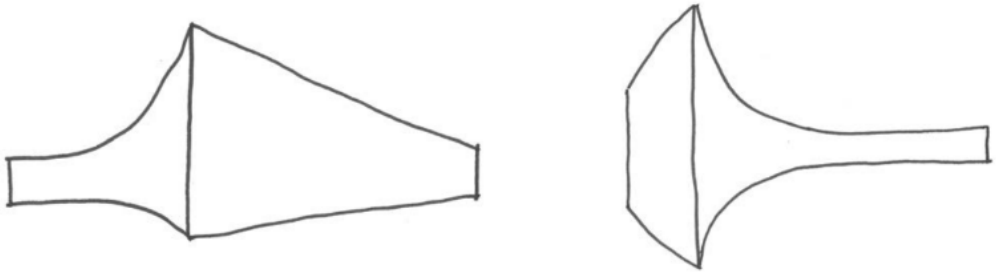


2.

Study the forms of your buildings and draw the curved lines on the elevations in dashes with your medium pen. The building on the left has one curved elevation (that curves within the drawn outline) and one rectilinear elevation. The house on the right is in the form of a crescent. Therefore, looking at the house from the corner one can see the outer, convex curve extending outside of the outline on the left of the corner, while the inner, concave curve on the right of the corner remains inside the outline.

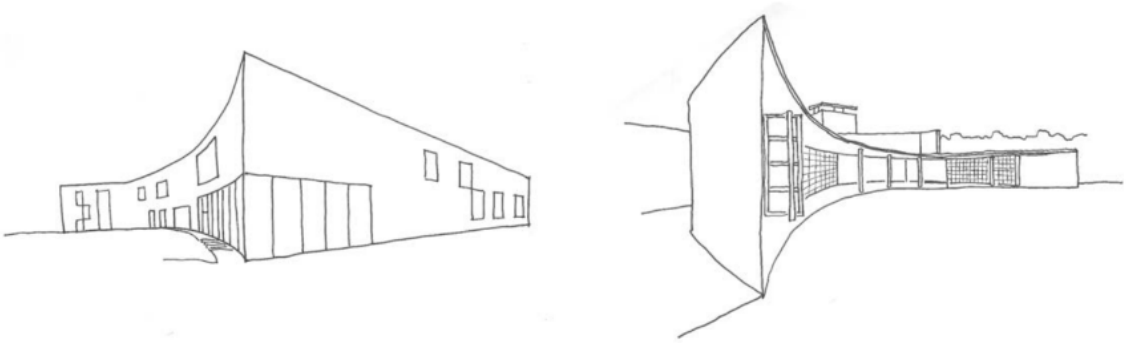
3.

Draw the outline of your buildings without guidelines. Continue to practice as necessary to achieve a curve with a smooth, consistent line.



4.

Draw your buildings with architectural and exterior detailing, including sidewalk paving, exterior steps, and vegetation.



BUILDING SPECIFICATIONS (from left)

Trinity Laban Conservatoire of Music & Dance
Herzog & de Meuron | London, UK | 2003

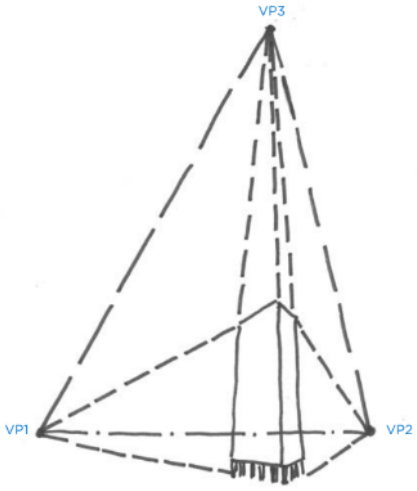
Crescent House
Make Architects | Wiltshire, UK | 2000

MULTI-POINT PERSPECTIVE

For most of this book, the focus has been on understanding and mastering one- and two-point perspective views in sketches. As discussed, one-point views occur when you are looking directly at a building, and two-point views occur when you have an angled view of a building, toward an edge or a corner, for example. However, there are many buildings that incorporate more than two VPs. This can be seen in buildings with complex rooflines, or more modern buildings that incorporate uncommon forms. This exercise will examine three-point perspective drawings, looking up or down at a building, as well as more complex buildings that have four or more VPs when viewed from the standard 5-foot eye level.

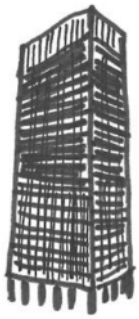
The five principles of three-point perspective:

1. Two of the VPs are located on the horizon line.
2. The third VP is located above the horizon line (if you are looking up) or below the horizon line (if you are looking down).
3. All lines recede to a VP (there are no horizontal or vertical lines).
4. All objects get smaller as they recede into the distance.
5. All objects will become foreshortened, since all objects are located on orthogonal lines.



1.

Part 1: Select a tall building Sketch your building from a three-point perspective, looking up at the building. Show your dashed lines and indicate the location of the VPs.

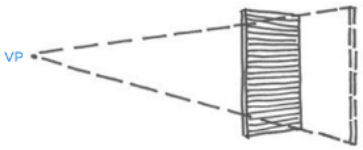


2.

Sketch the building quickly with a thick pen, adding more architectural detail.

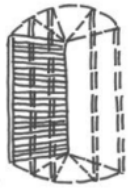
OPEN + CLOSED

Some buildings are radically transformed by the opening and closing of a moving panel such as a door, shutter, or window, changing the overall feel of the interior space and the appearance of the exterior. These mechanisms generally move on a hinge, pivot, or track—effecting a change from closed/dark to open/light. This exercise examines such elements, specifically how to detail a moving panel in perspective. The example chosen is a house that incorporates oversized panels which open and close. These will be analyzed individually and then explored within the larger context of the building.



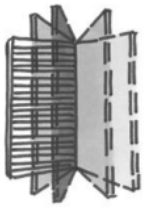
1.

Select a building with a moving element
Practice drawing the moving panel (in this case, a door). Draw the panel closed and render its material of construction (in this case, slatted wood). Then outline the panel in the open position. Mark the dashed lines that recede to your VP.



2.

Draw your panel again in the closed position with the open position dashed. Draw a dashed curved line from the top corner of your closed panel to the top corner of your open panel. Draw some imaginary panels at different increments along your curved line to show the panel moving from closed to open.

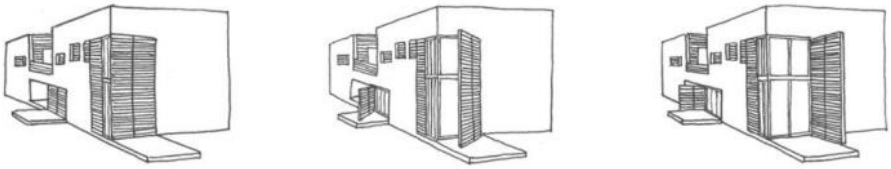


3.

Draw your panel again in the closed position. Render the ghost panels from dark to light, with the darkest value used for the position at which the panel comes closest to the viewer.

4.

Draw your view three times, with the panel in the open, half-open, and closed positions.



5.

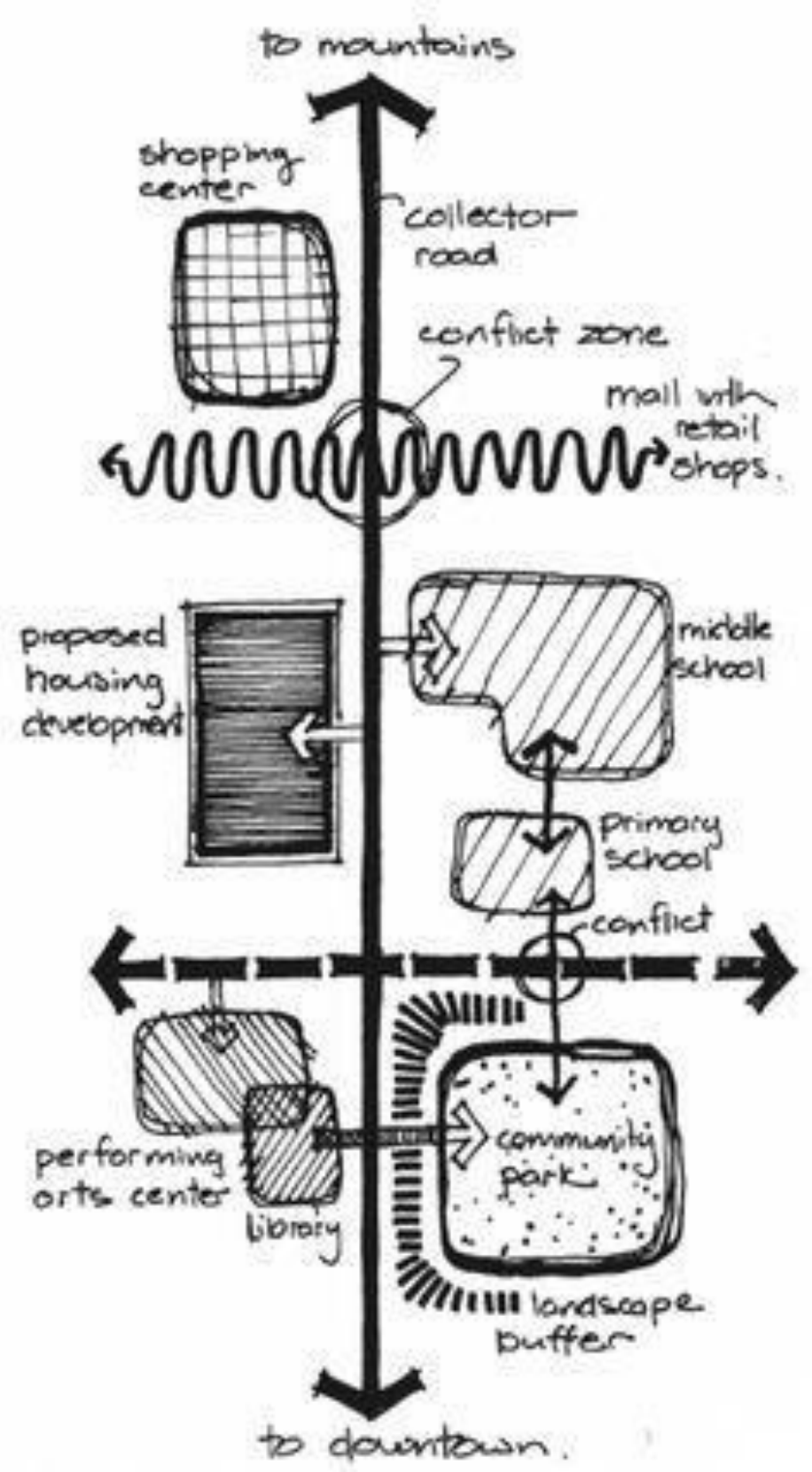
Draw the panel in isolation in each of the three positions: open, half open, and closed. Render the panel using a dark value for closed, a medium value for half open, and a light value for open.

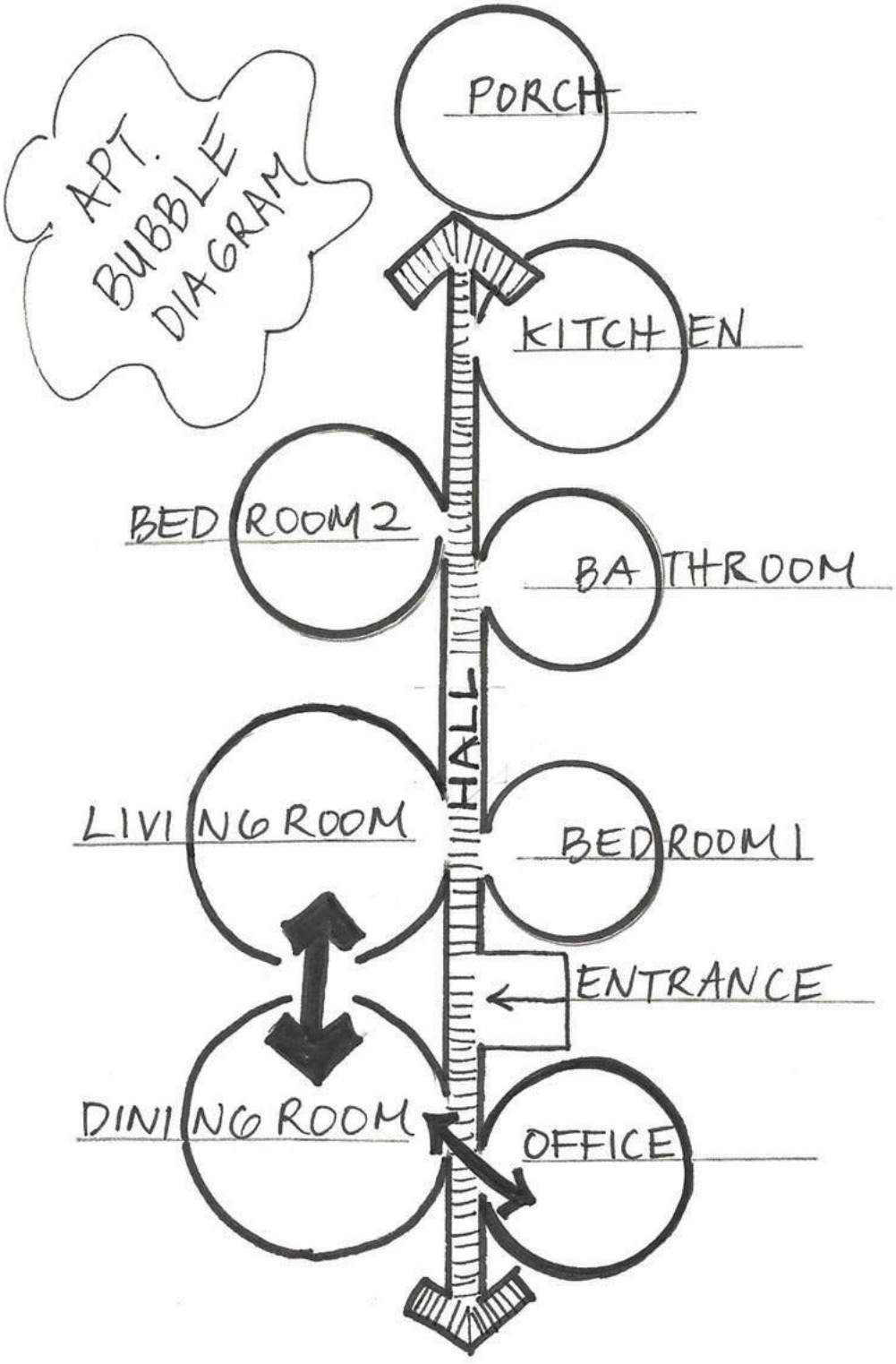
6.

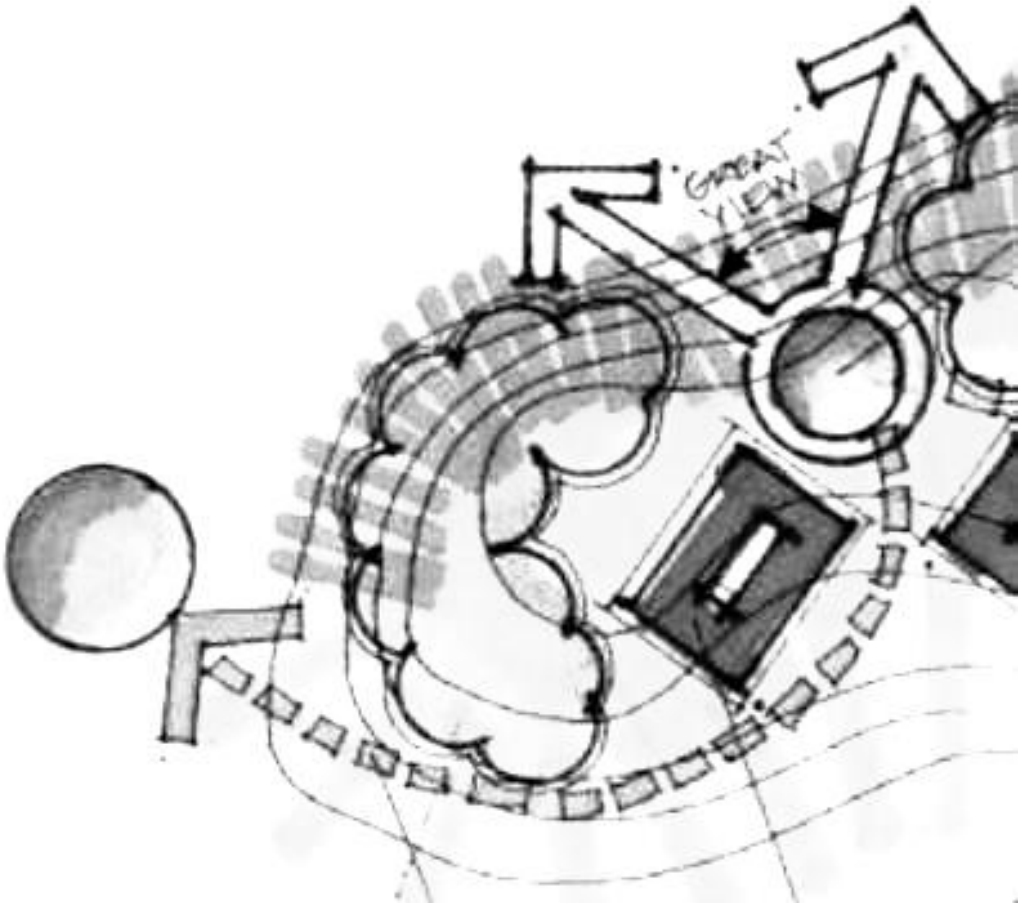
Using previous skills learned, render your three sketches showing the exterior building materials. In this example a light pen was used to render the horizontal multi-length strips of wood.

Stephanie Travis, 2015, Sketching for Architecture + Interior Design, Laurence King publishing, London

Diagrams

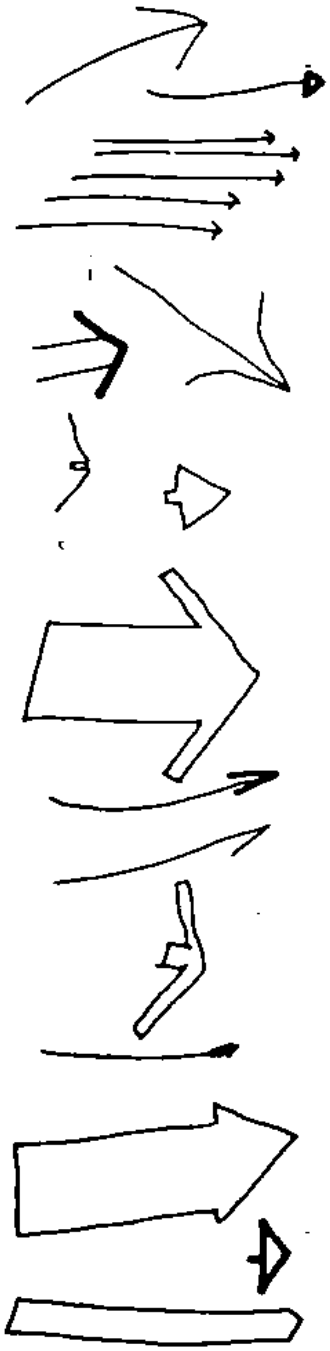

to mountains
shopping center
collector road
conflict zone
mall with retail shops.
proposed housing development
middle school
primary school
conflict
performing arts center
library
community park
landscape buffer
to downtown.


APT.
BUBBLE
DIAGRAM
PORCH
KITCHEN
BEDROOM 2
BATHROOM
HALL
LIVING ROOM
BEDROOM 1
ENTRANCE
DINING ROOM
OFFICE

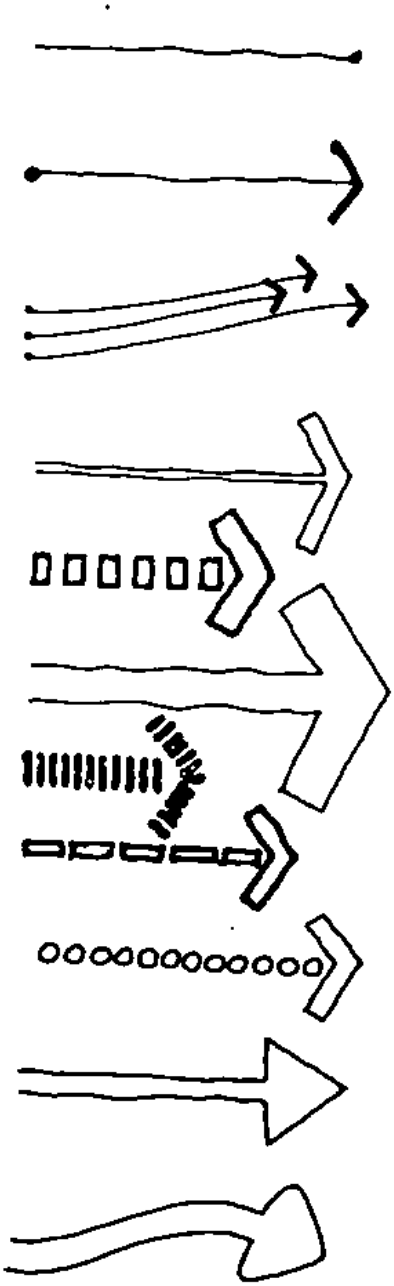

GREAT
VIEW

● Arrowheads

initial diagrams



refined diagrams



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