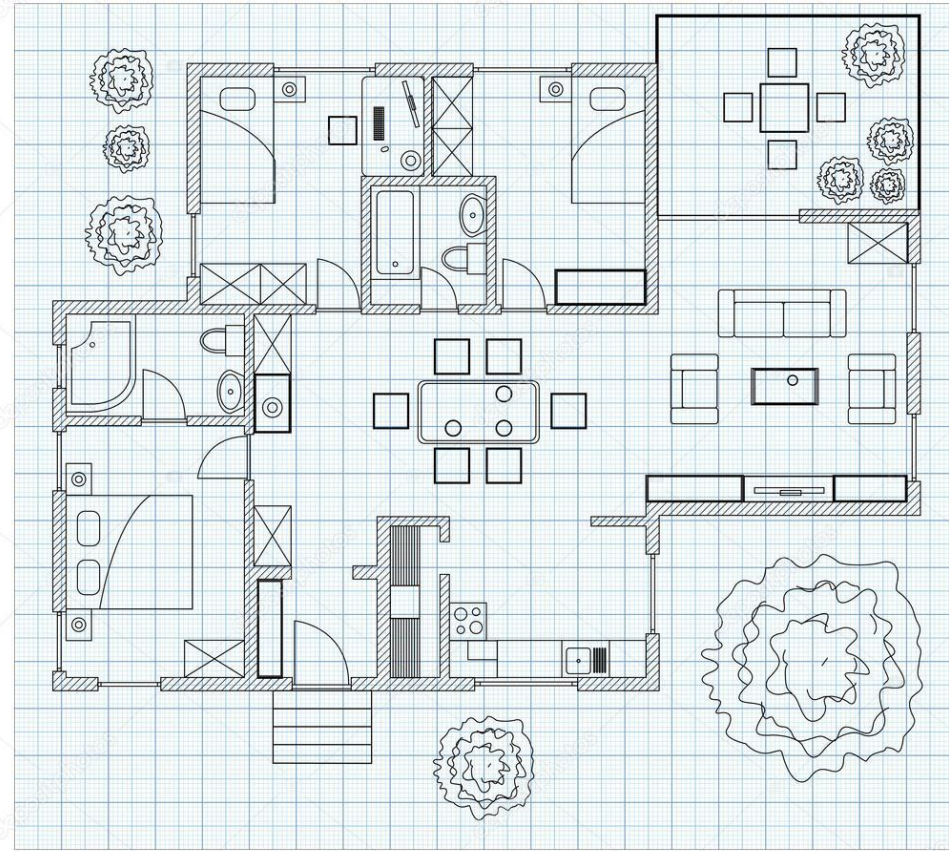


M1: Introduction to Architectural Visual Graphics and Orthographic Drawings

- What do you think is easier to understand, an architectural model or an architectural drawing?
- Have you ever read blueprints before?
- Why are they called “blueprints”?
- What is a “plan”?



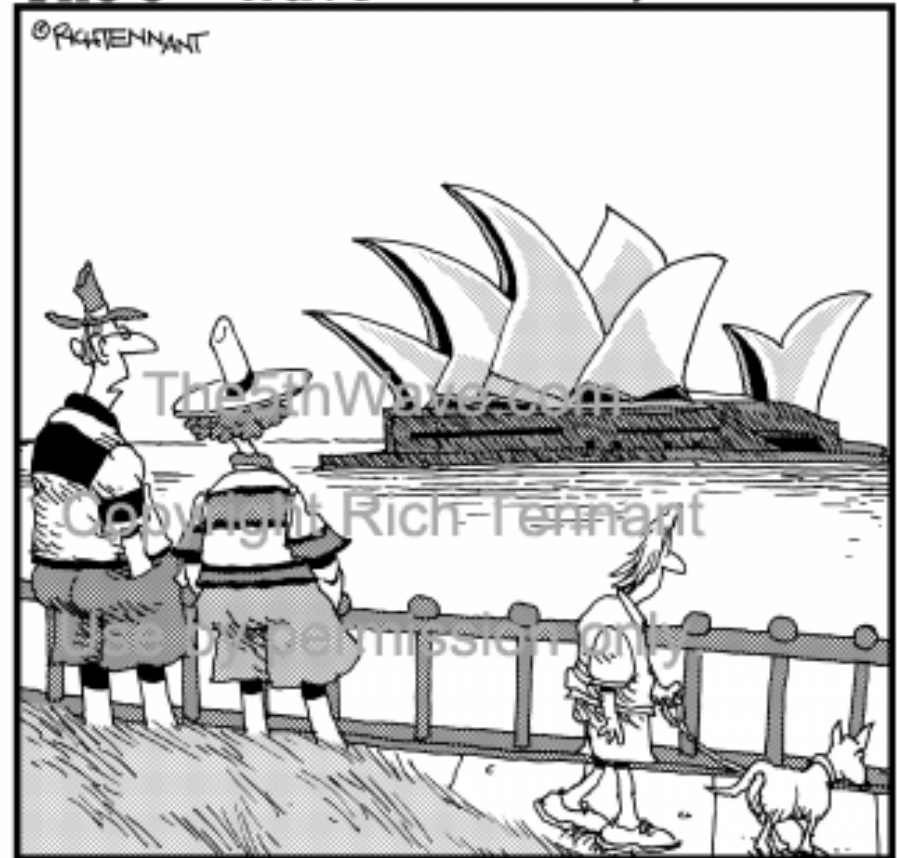
This is a plan!

OVERVIEW OF OBJECTIVES:

1. Understand scale in architectural drawings.
2. Define and compare plan, section, elevation, perspective and axonometric drawings.
3. List and compare methods of architectural visualization, hand drawing, painting, hand modeling, CAD, 3D CAD, BIM, Infographics, Virtual Reality.

The 5th Wave

By Rich Tennant



"There were several injuries during the building of the Sydney Opera House. Most of them architects who inadvertently sat on the scale model."

Why do designer's draw their plans to scale?

Typical Drawing Scales

Plans/Elevations:

1/16 inch = 1 foot (1 192nd of actual size)

1/8 inch = 1 foot (1/96th of actual size)

1/4 inch = 1 foot (1/48th of actual size)

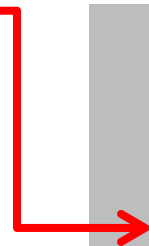
Sections/Details:

3/4 inch = 1 foot (1/16th of actual size)

1 ½ inches = 1 foot (1/8 of actual size)

3 inches = 1 foot (1/4 of actual size)

Architect's Scale

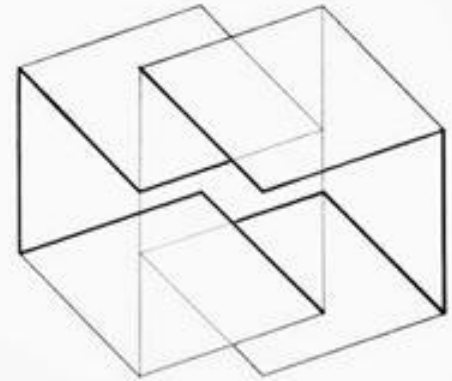
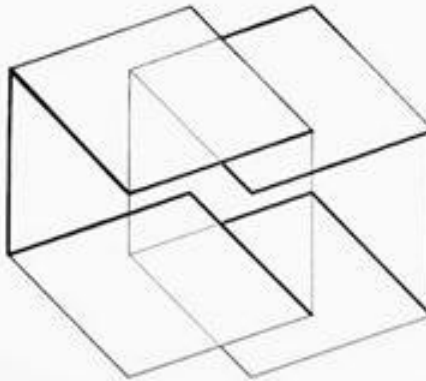
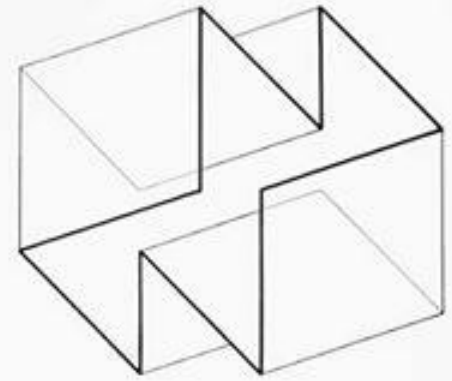
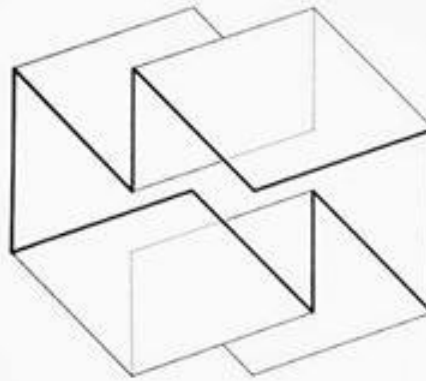


*In the United States,
what is our system
of measurement?*

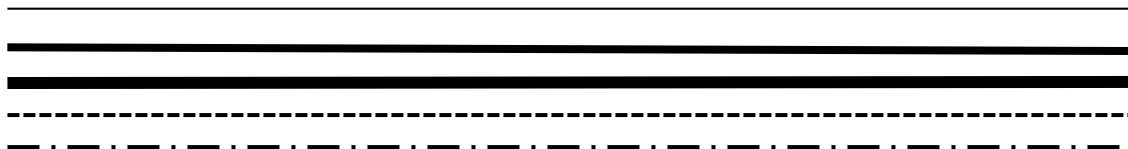


Scale, Line weights and Detail

- Different scales of drawings call for more or less detail
- Line weight (how WIDE the line is) will fundamentally change how a drawing is understood
- Different lines have different typical meanings in an architectural drawing— dashed vs. solid, etc.
- Architectural drawing is fundamentally “SYMBOLIC”
Drawing standards and typical symbols can help you to ‘read’ architectural drawings

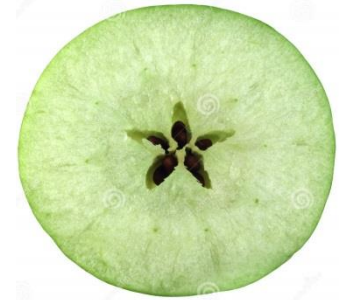


Josef Albers Structural Constellation



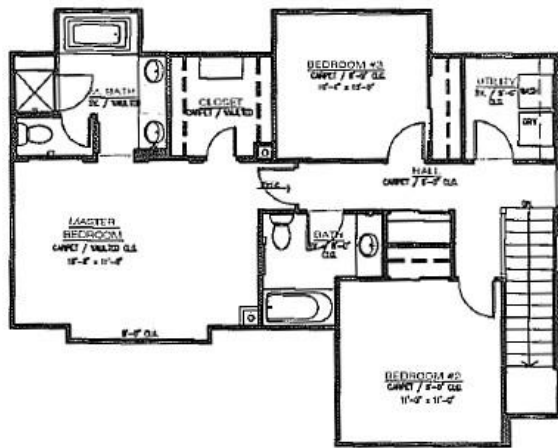
PLAN DRAWINGS- "The Map"

MEASURABLE

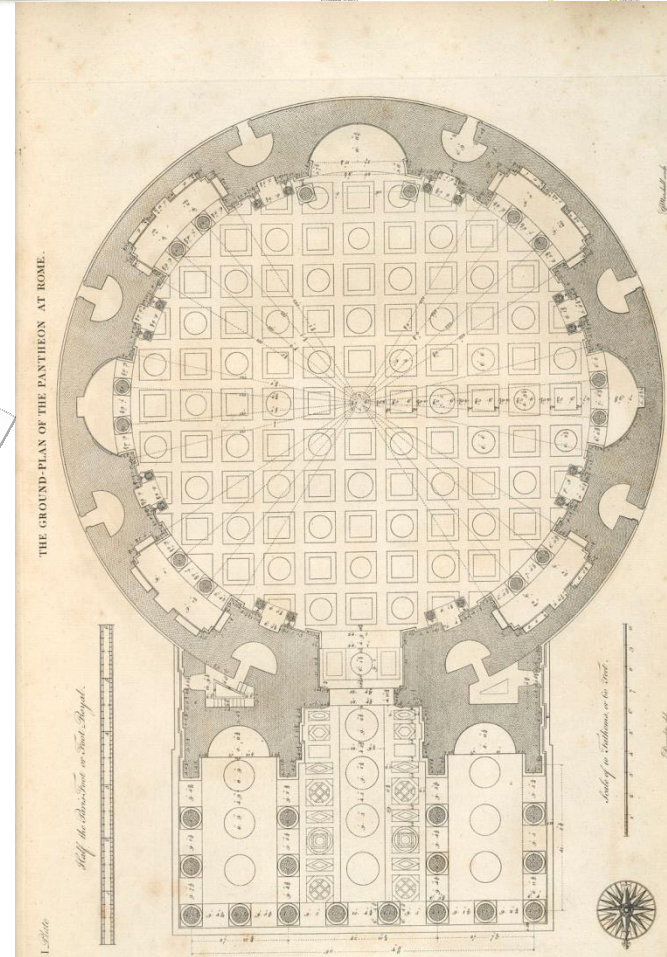
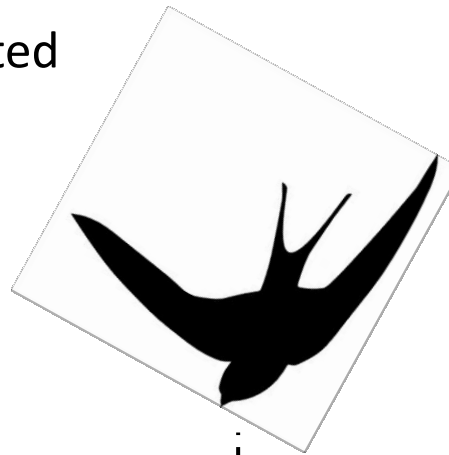


Definition: A type of "multiview" drawing that provides a view of a space from the horizontal picture plane. A drawing that ***cuts the space through horizontally*** revealing items that lie below normal eye level (typically 4 ft to 5 ½ ft above ground)

Types: floor plans, site plans, reflected ceiling plans



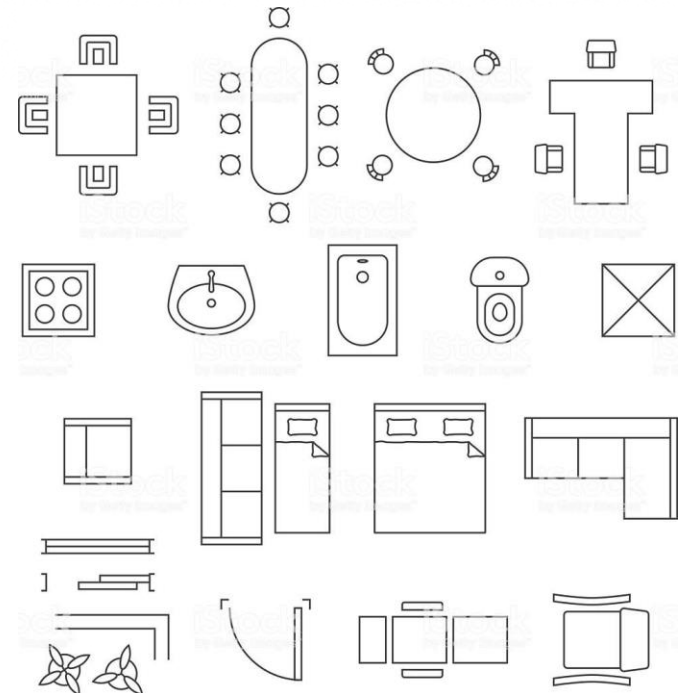
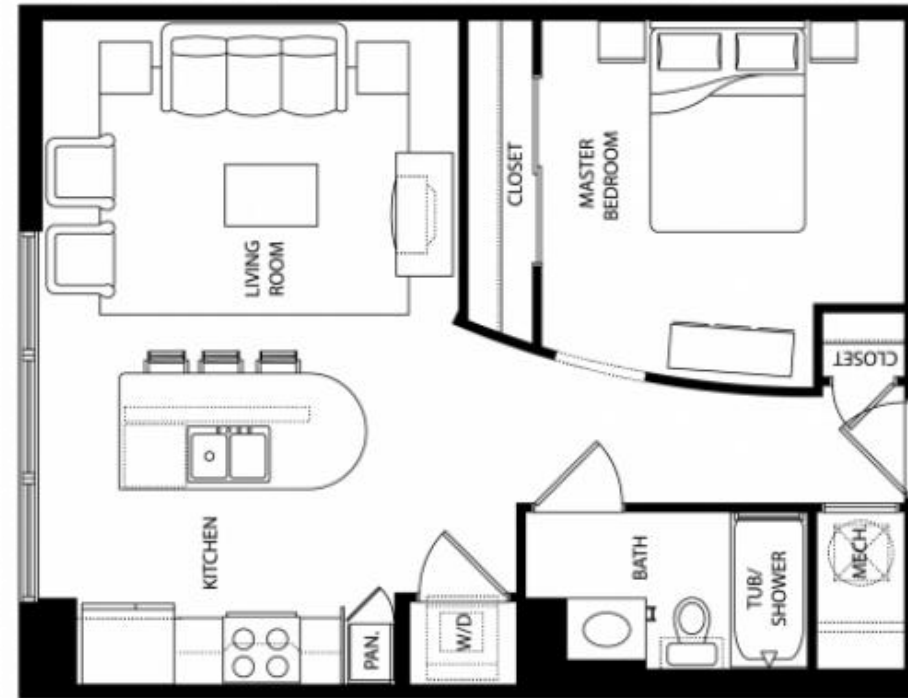
UPPER LEVEL



PLAN DRAWINGS- “The Map”

Some tricky things about plans:

- This is **not** the way we experience space, but plans are essential for measuring space
- Plans are very symbolic
- The “cut” location should be at 4’-0” above the floor, but it changes...
- Line thicknesses or “weight” symbolically expresses a lot of information
- Plans show the thickness of walls and other elements
- There are a lot of poorly drawn plans out there



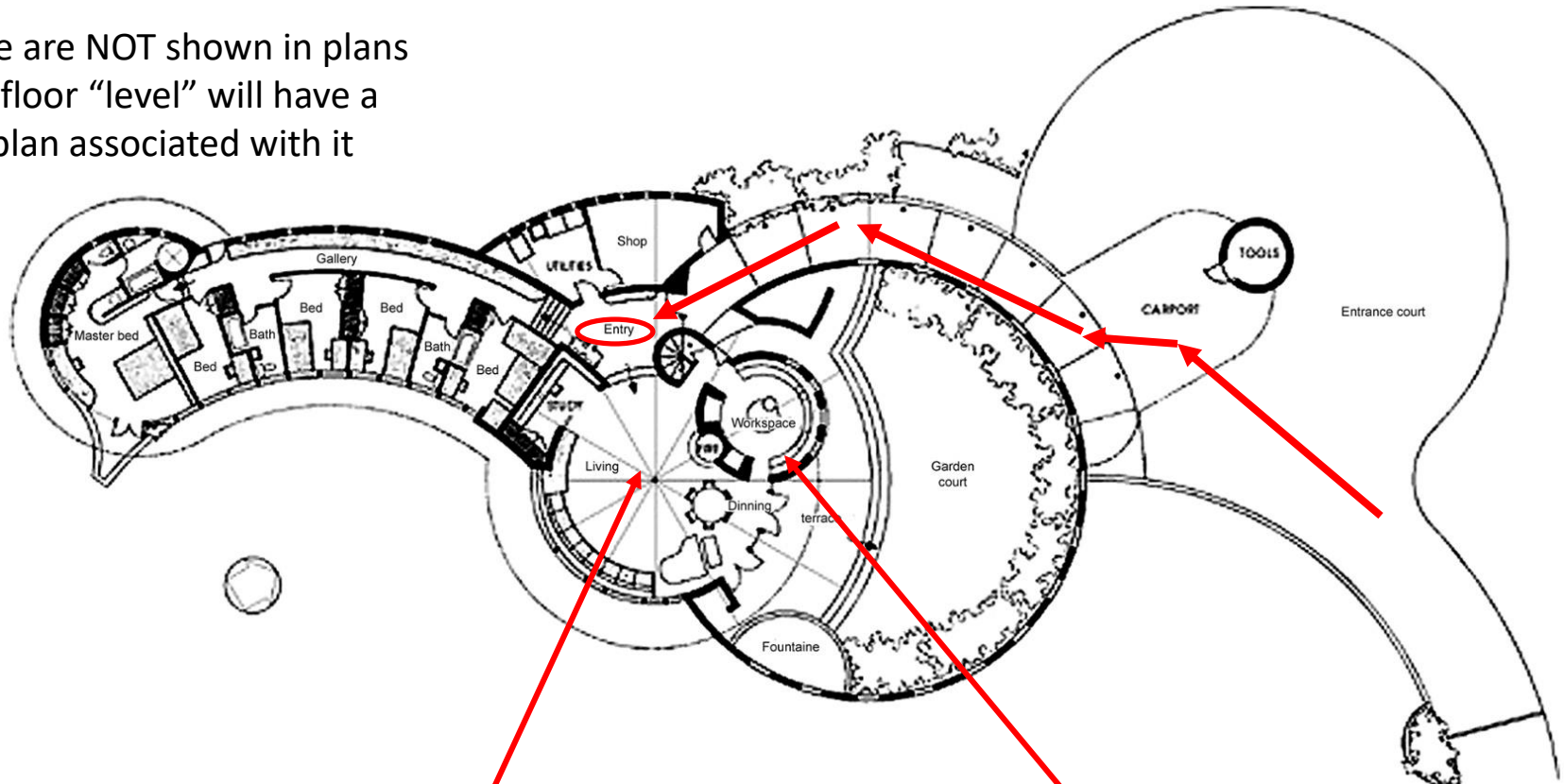
Which one is a door? 

EXAMPLES OF PLAN DRAWINGS- “The Map”

Hint:

People are NOT shown in plans

Every floor “level” will have a floor plan associated with it



Lykes House, Frank Lloyd Wright



Pause the Lecture Here:

Try to draw a plan of the room you are sitting in right now...

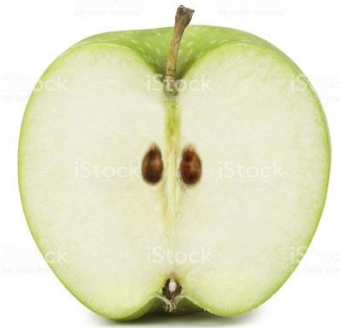
SECTION DRAWINGS- “The Cave”

MEASURABLE

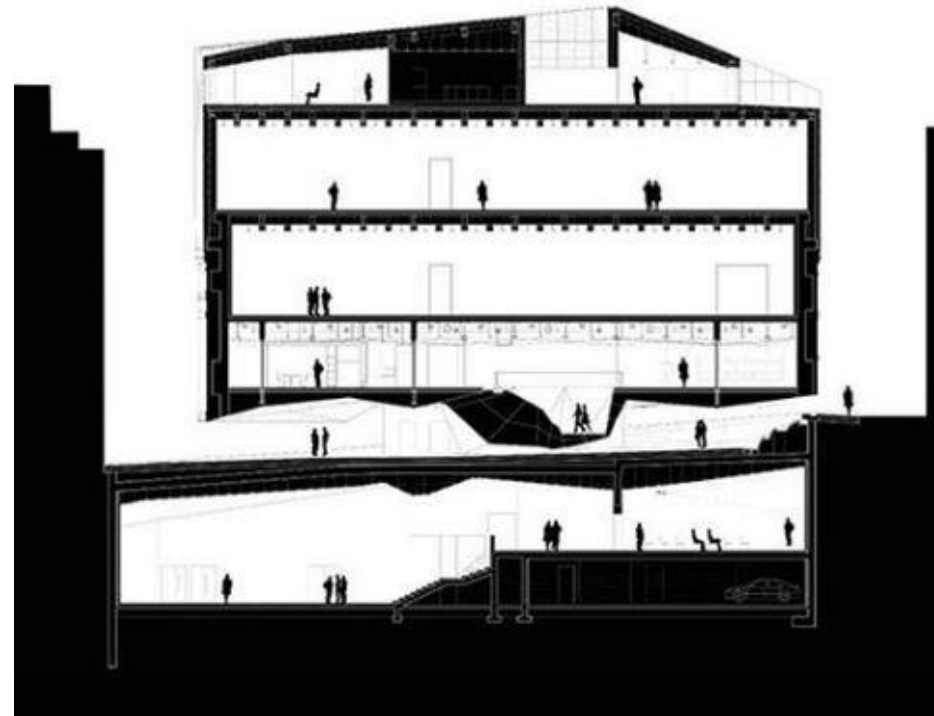
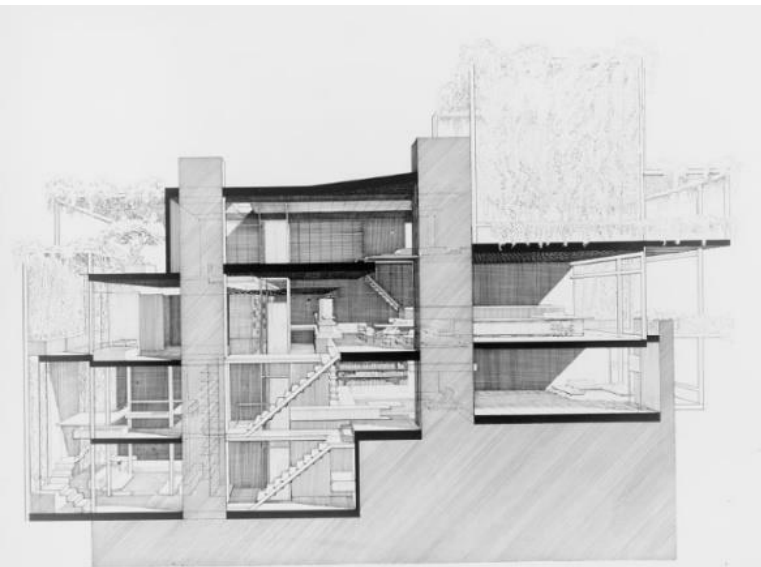


Definition: A type of “multiview” drawing that is an orthographic projection of an object as it would appear if *cut through by an intersecting plane vertically*, opening it to reveal its internal material.

Types: building sections, detail sections or wall construction sections

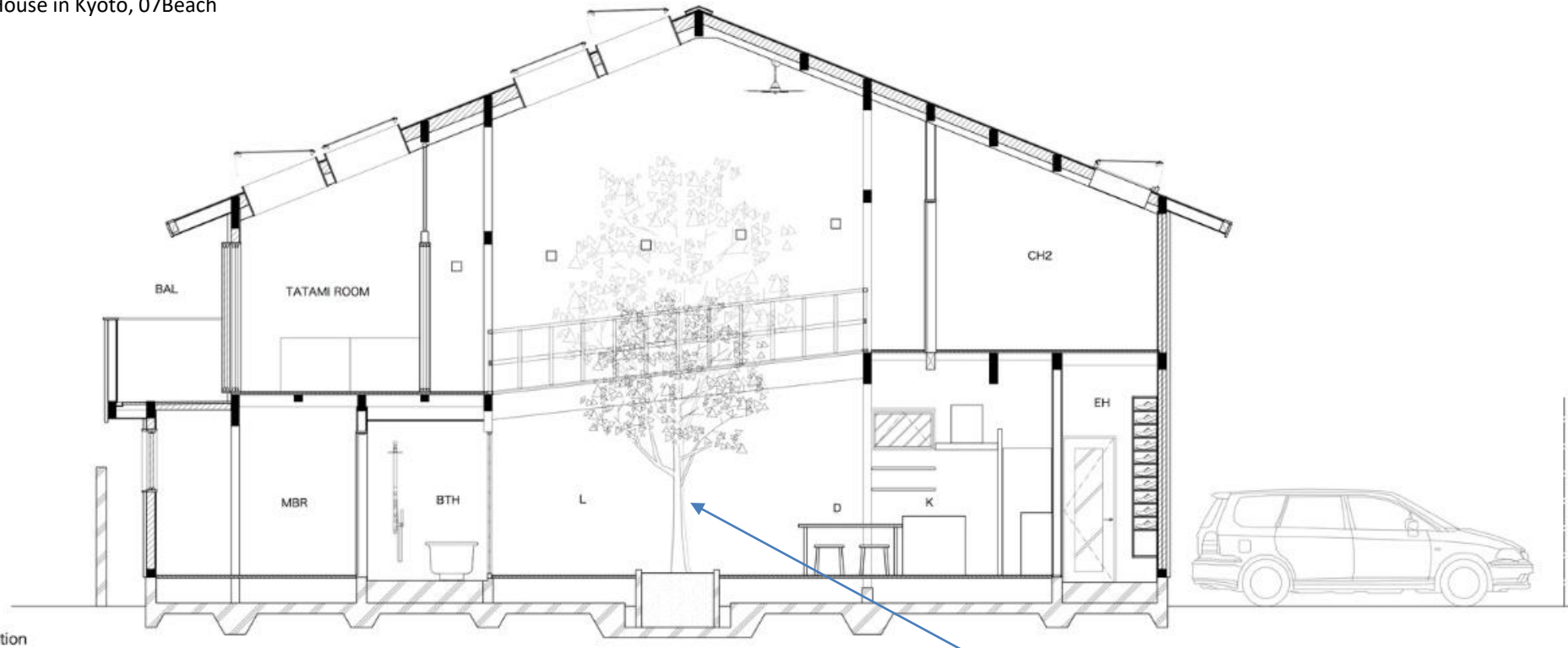


Section Drawings



EXAMPLES OF SECTION DRAWINGS- “The Cave”

House in Kyoto, 07Beach



Hints:

Often silhouettes of people are shown in section drawings

Sections are more like how we experience space

Sections measure things vertically

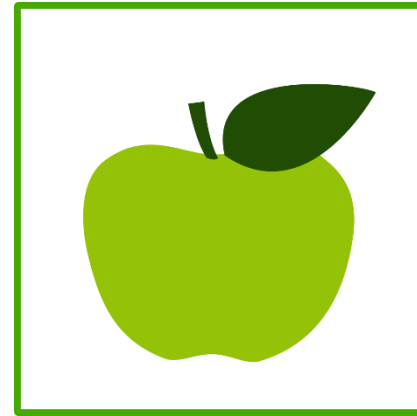


ELEVATION DRAWINGS- “The Flat Picture”

★
MEASURABLE

Definition: A type of “multiview” drawing that is an image of a space ***projected orthographically*** onto a vertical picture plane parallel to one of the principal faces.

Types: Building or Exterior Elevations, Interior Elevations, Detail Elevations



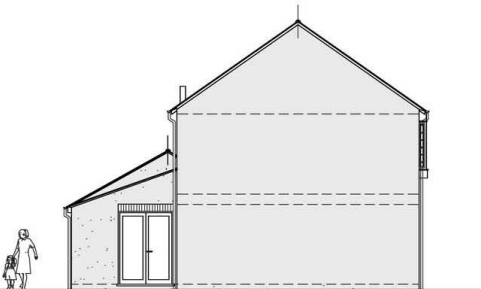
EXAMPLES OF ELEVATION DRAWINGS- “The Flat Picture”

Hint:

- Elevations are like flat pictures, we don’t see this way
- Often silhouettes of people are shown in elevations
- Sometimes they have shadows and sometimes they don’t



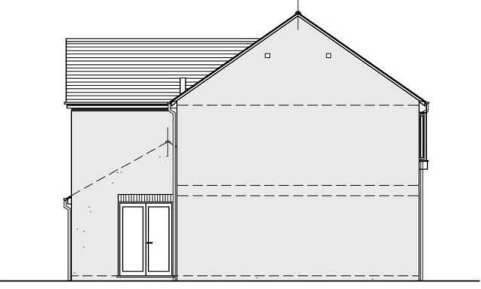
North (Rear) Elevation - Existing



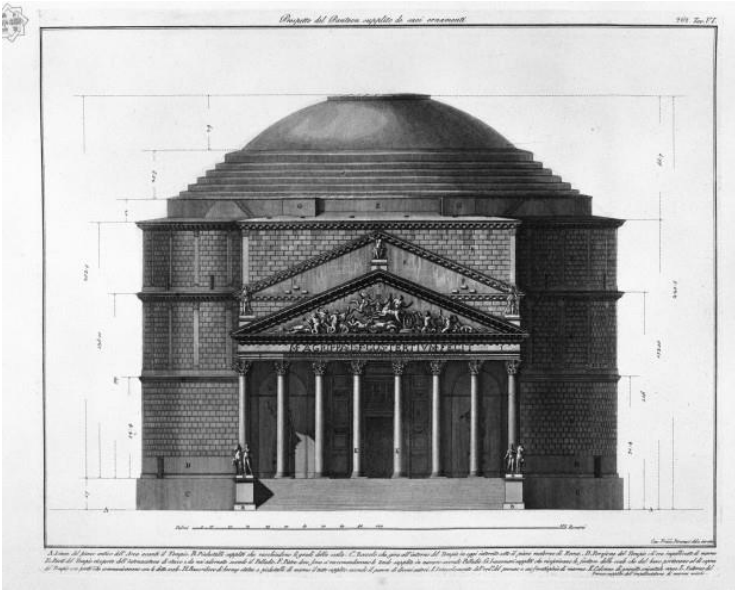
West (Side) Elevation - Existing



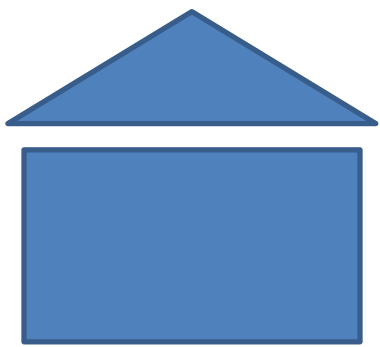
North (Rear) Elevation - Proposed



West (Side) Elevation - Proposed



Flat Pantheon Front

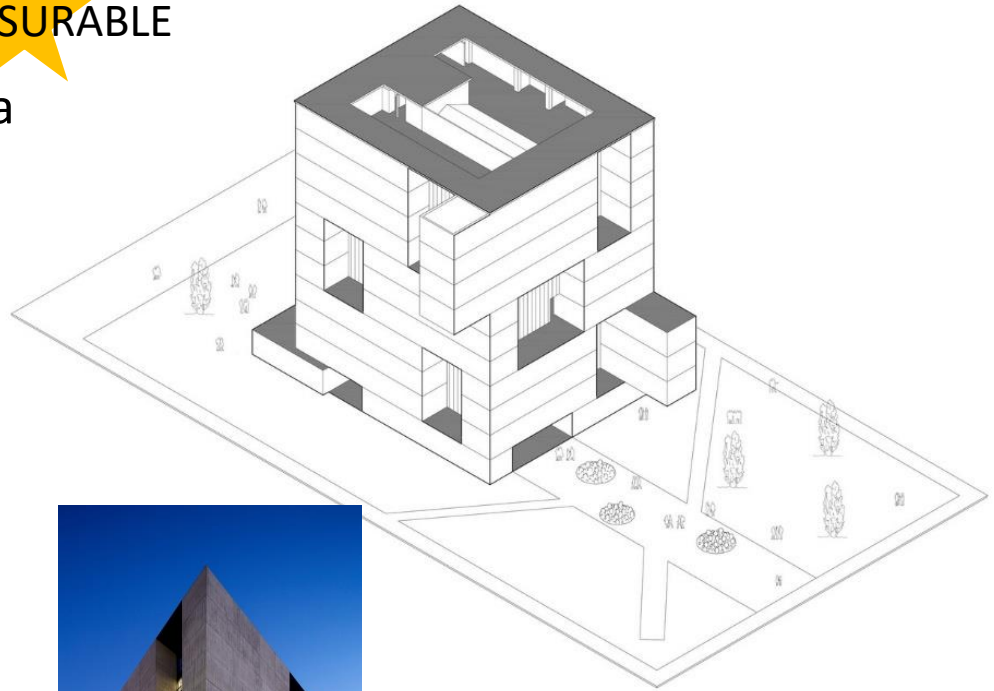


AXONOMETRIC DRAWINGS-

MEASURABLE



AXON



PICTURE

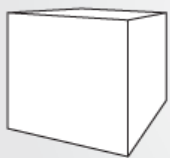
[Innovation Center UC - Anacleto Angelini / Alejandro Aravena | ELEMENTAL](#)

Definition: A type of drawing similar to a perspective, but that project **scale dimensions** for width, height and length without vanishing points.

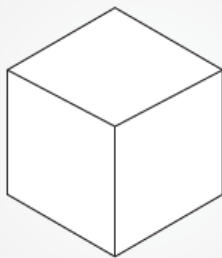
Types: Axonometrics, Isometrics, Dimetrics, 'exploded' axonometrics

Hint:

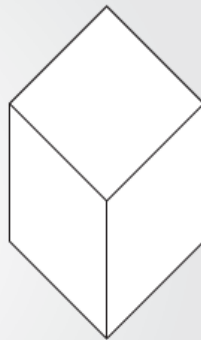
- Axons are mathematically measurable, but we don't see this way
- Axons are good for seeing the whole building at once



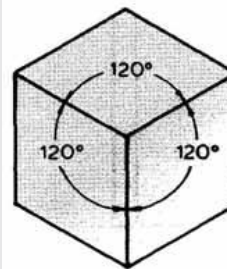
Perspective



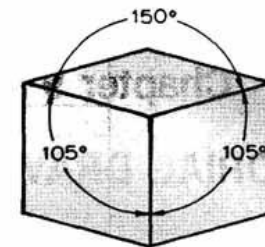
Isometric



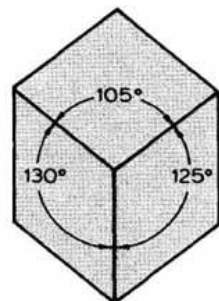
Axonometric



3 EQUAL ANGLES
ISOMETRIC



2 EQUAL ANGLES
DIMETRIC



NO EQUAL ANGLES
TRIMETRIC

PERSPECTIVE DRAWINGS- “3D Drawing”

Definition: A type of *unscaled drawing* that shows 3 dimensional space on a 2 dimensional surface with lines that converge at points on the horizon giving a virtually photographic view.

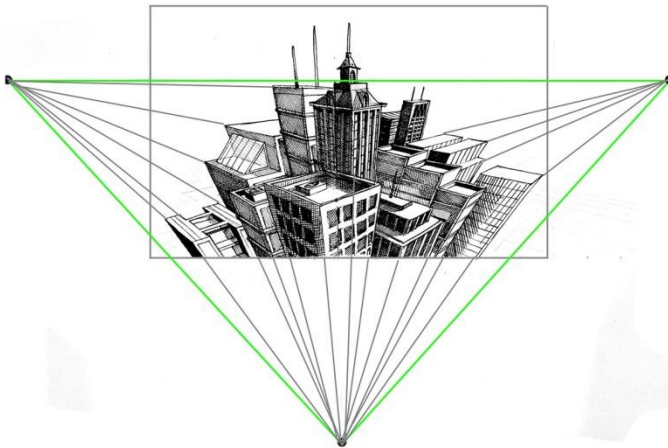
Types: 1-point perspective, 2-point perspective, 3-point perspective

Hint:

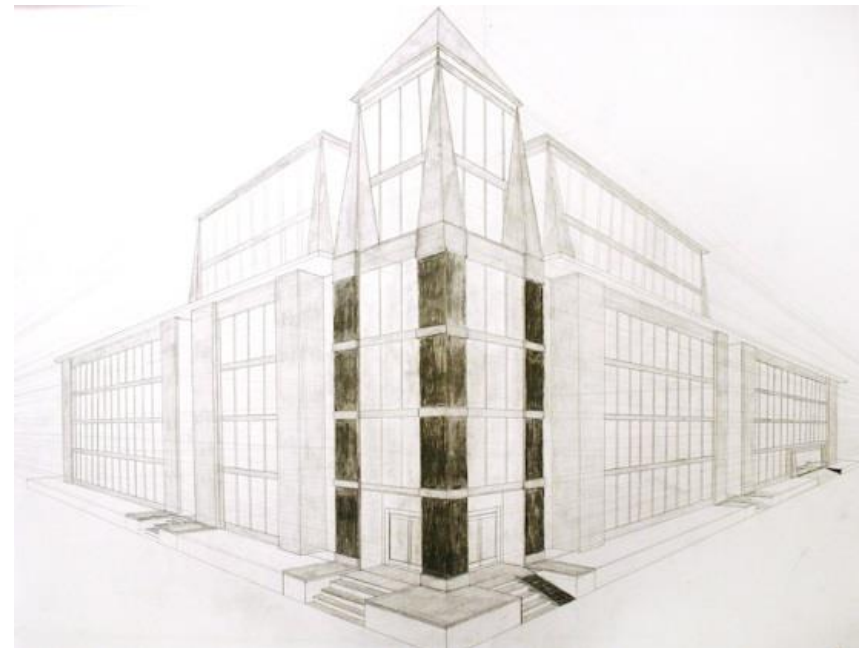
- Perspectives are NOT measurable
- Perspectives are closer to the way we see



1-POINT PERSPECTIVE



3-POINT PERSPECTIVE

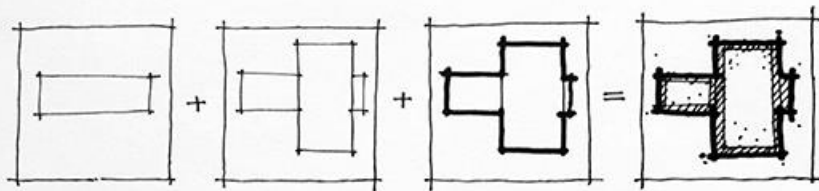


2-POINT PERSPECTIVE

METHODS: HAND DRAWING / PAINTING

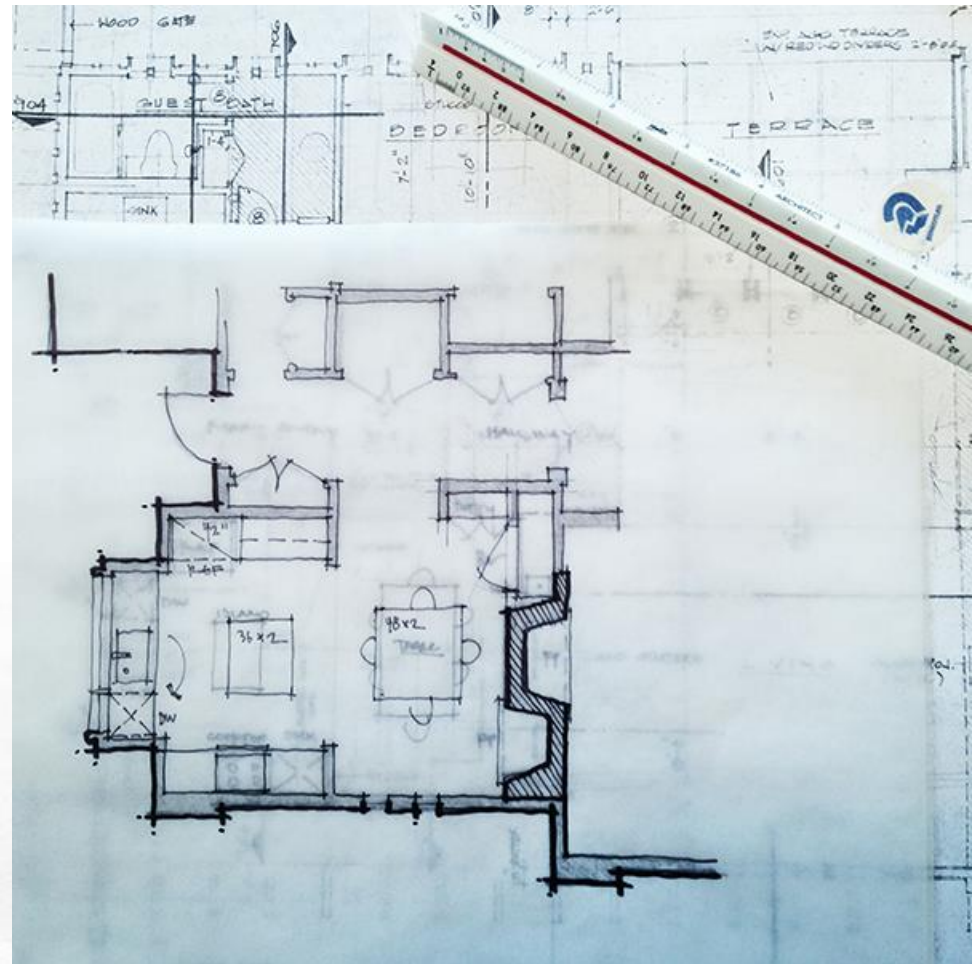
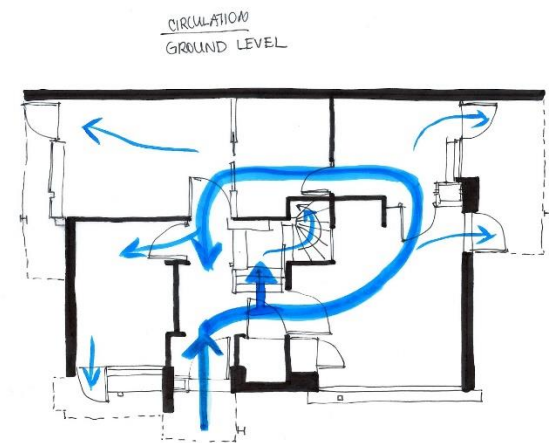
Definition: A drawing that is created using pencil, pen, paint, etc on paper which may or may not be in conjunction with a digital model or drawing.

Tools: trace paper, adjustable lead pencil, pens, gauche, watercolor, collage... you name it!



TIP #05

TRACE PAPER ISN'T PRECIOUS... DRAW IN LAYERS



METHODS: HAND DRAWING / PAINTING

Pros: The quickest, most efficient way to convey ideas. (our hands are still stuck to our bodies). Great at conveying subtle ideas such as mood and feeling. Can convey multiple ideas in the same place.

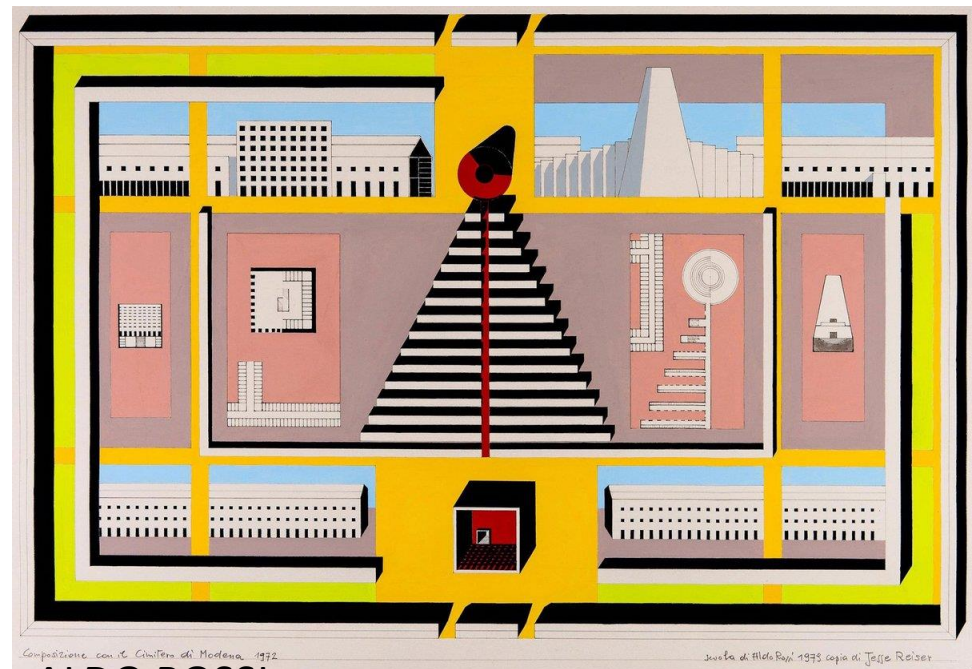
Cons: Not easily made scale-able and reproducible, although this might be changing with sketch to screen technologies.

References:

<https://www.lifeofanarchitect.com/>



MICHAEL GRAVES

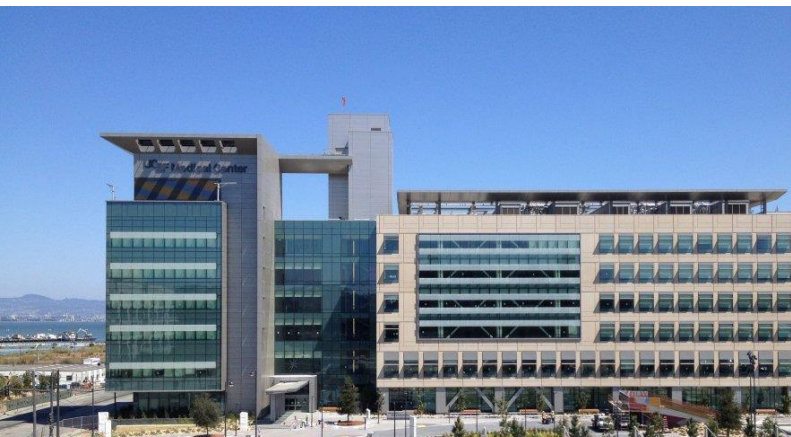
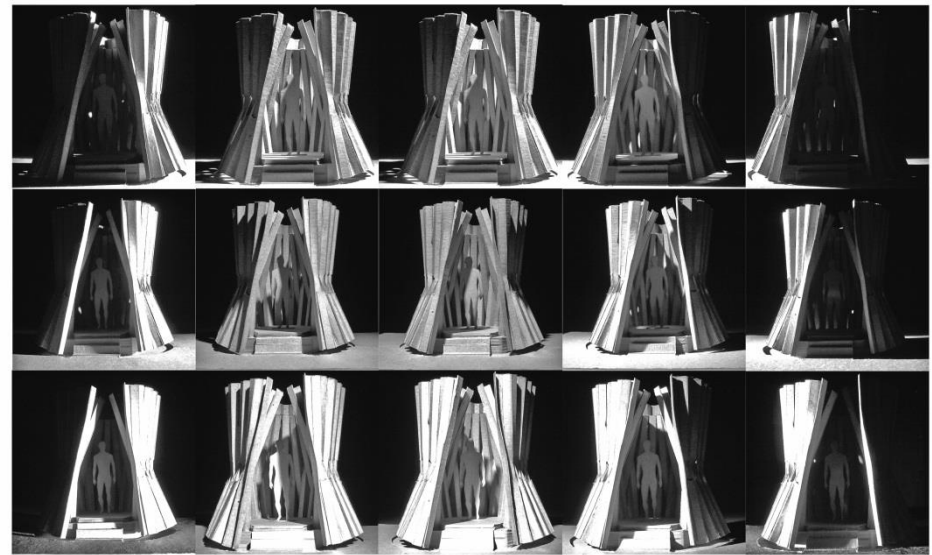


ALDO ROSSI

METHODS: HAND or PHYSICAL MODELING

Definition: A model that is created using any medium which may or may not be in conjunction with a digital model or drawing.

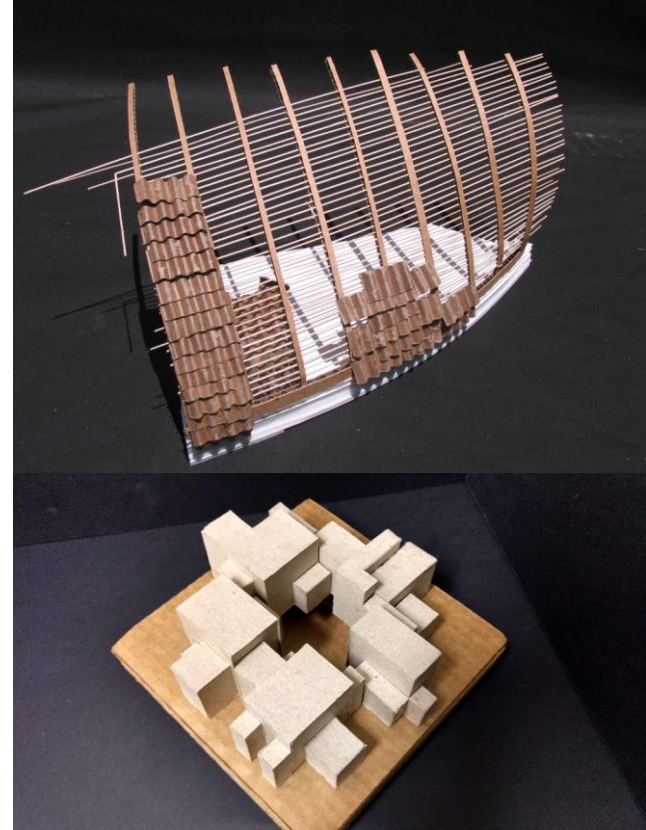
Tools: lazer cutter, 3D printer, CnC router, glue, paper media, balsa wood, more glue



METHODS: HAND or PHYSICAL MODELING

Pros: Similar to hand sketching, great at showing quick concepts and overall feeling of ideas. Can be easily shown to others, worked on and changed. Can be used to understand elusive concepts such as light.

Cons: Difficult to scale and reproduce and translate into drawings.



SKETCH MODELS



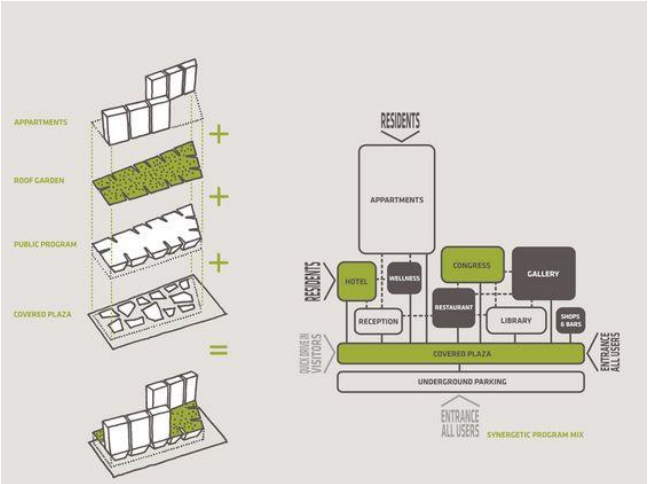
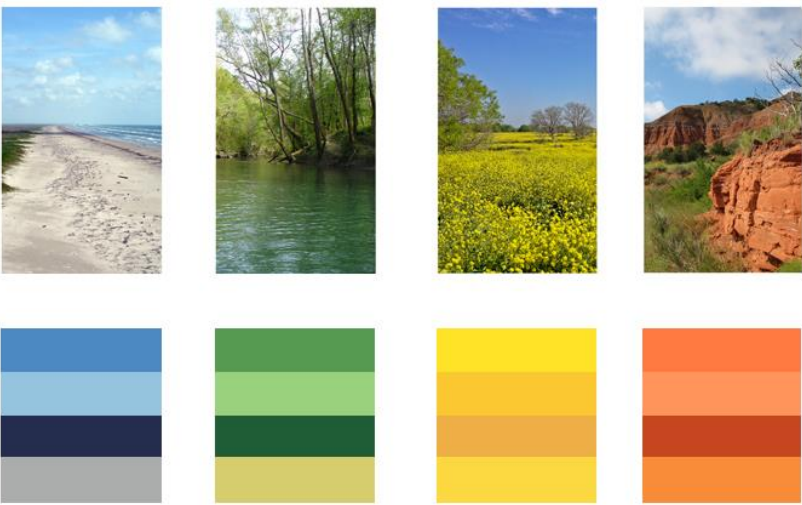
METHODS: INFOGRAPHICS

Definition: Drawings that express data to support architectural design decisions.

Tools: Adobe Suite- InDesign, Photoshop, Illustrator, Powerpoint, Microsoft Suite, countless others...

Pros: Can be very helpful in supporting ideas about your design.

Cons: Can sometimes overwhelm the architecture and be unclear or deceptive in presenting data.



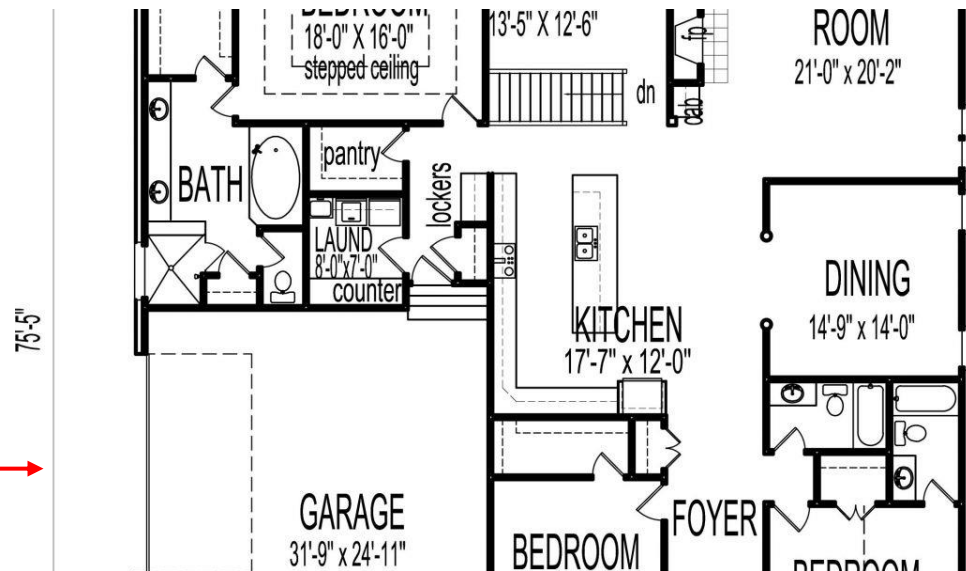
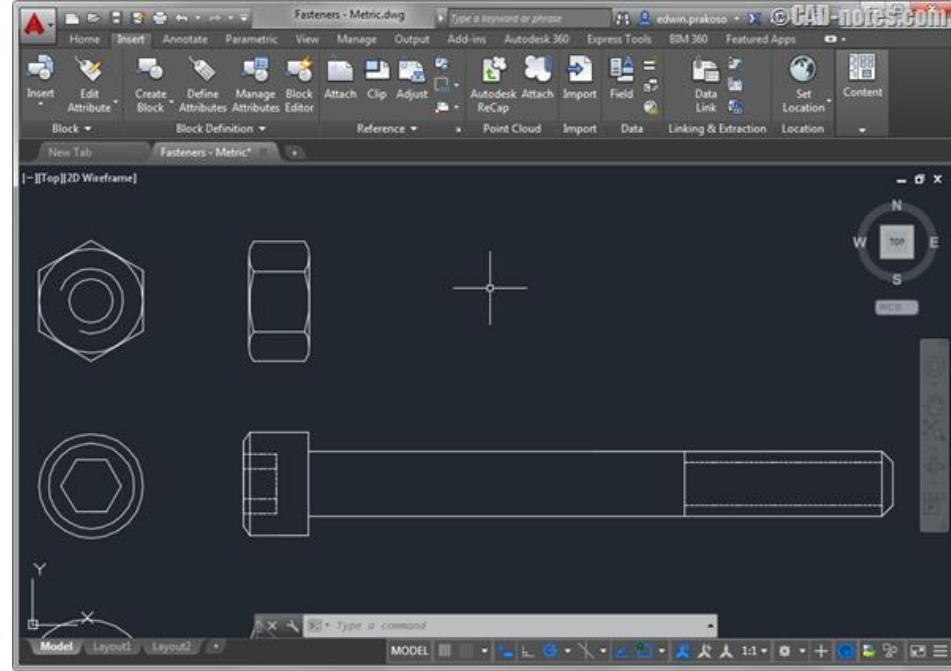
METHODS: CAD (Computer Aided Drawing)

Definition: Two dimensional drawing that is achieved through the use of a computer.

Tools: AutoCAD is the most common.
Also: ArchiCAD, other freeware products

Pros: Produces scaled, accurate drawings that can be used for construction as well as design concepts. Can be worked on in 1:1 scale. Relatively easy to learn. Easy to get varying lineweight

Cons: Can be difficult to understand scale and overall concepts. All drawings unrelated to each other- ie) not smart. Hard to see without printing. Has somewhat of a signature look.



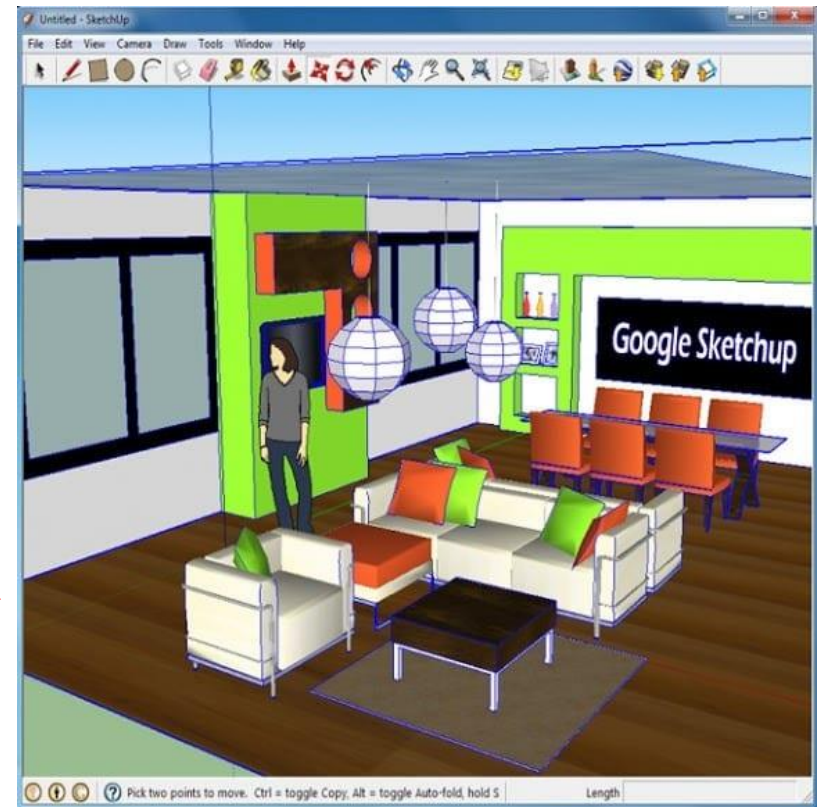
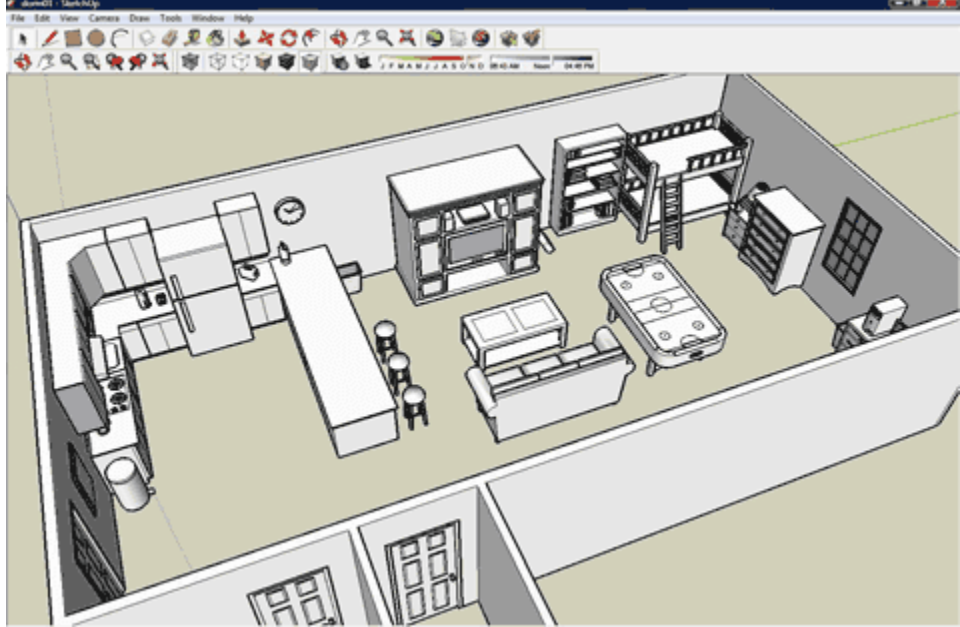
METHODS: 3D CAD (3D Computer Aided Drawing)

Definition: Three dimensional drawing that is achieved through the use of a computer that *does not have data* associated with elements.

Tools: AutoCAD 3D, SketchUp, Rhino, other software

Pros: 3D interface helps to explain concepts better than 2D CAD. Easy to learn, can produce quick renderings. Can be scaled, but cumbersome

Cons: Difficult to produce construction drawings and accurate details. Can be unwieldy to untrained designers. Still need to “print” out views to share with clients usually. Has a signature “look” which is difficult to change.



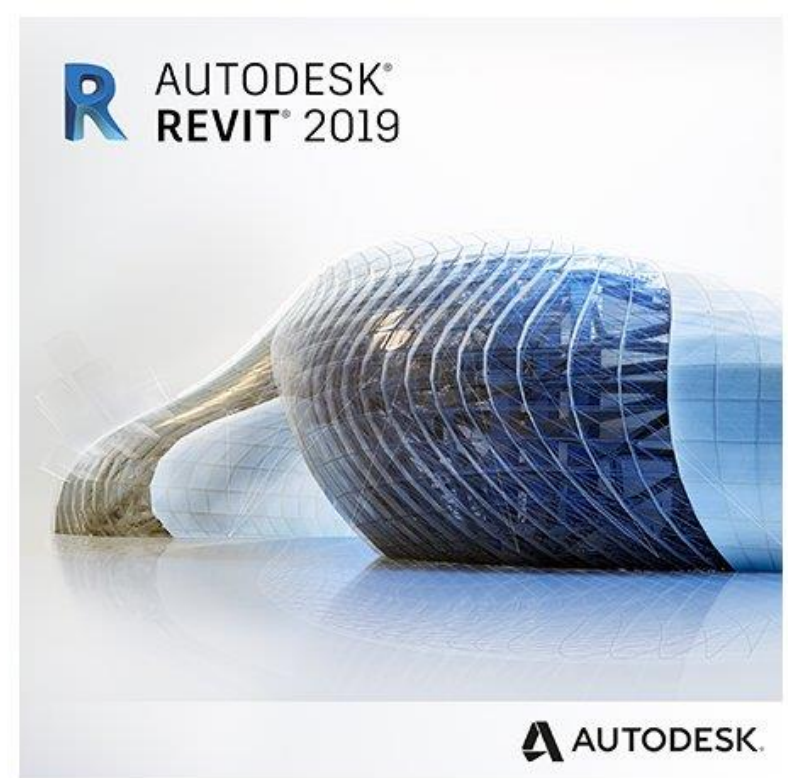
METHODS: BIM (Building Information Modeling)

Definition: Three dimensional drawing that is achieved through the use of a computer that includes a data-rich program allowing for increased information gathering.

Tools: Autodesk Revit, Vectorworks, others

Pros: Industry standard now, very easy to collaborate with consultants and related disciplines , can create schematic designs, construction documents. Single model- smart objects.

Cons: Somewhat difficult to learn, can be difficult to create quick sketches, also has a signature look that is hard to change.

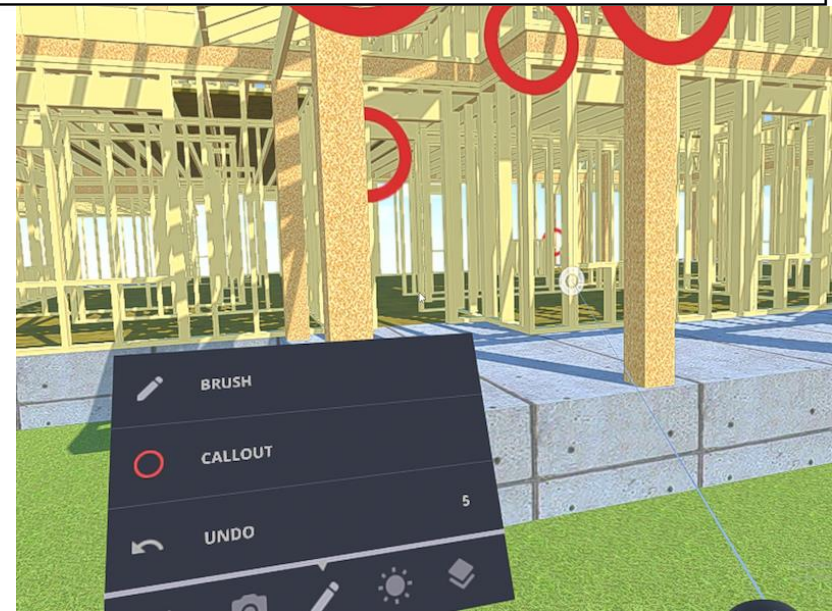
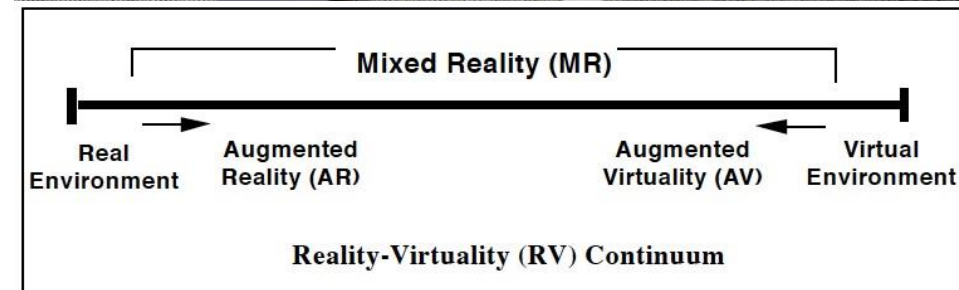


METHODS: VIRTUAL REALITY

Definition: A life-size, 3D virtual environment without the boundaries we usually associate with TV or computer screens. Whatever way you look, the screen mounted to your face follows you. This is unlike [augmented reality](#), which overlays graphics onto your view of the real world.

Tools: Many tools for “viewing” and “manipulating” the model once it is created

Creation of the model still needs to happen in 3D modeling program powerful enough to maintain a rendered appearance while moving around in the model.



METHODS: VIRTUAL REALITY

Pros: can show team the height, depth and scale better than a printed page, can facilitate better feedback loops

Cons: requires a lot of training and client expectation management, requires ability to purchase and use software, individualized experience-hard to be in the same model together.



HMC Architects using VR

<https://www.bdcnetwork.com/virtual-reality-how-three-firms-are-using-vr-technology>



WoodsBagot Architects using VR with clients

CONCLUSION / SUMMARY:

1. Everyone in the design needs to be familiar with the concept of scale models and scaled drawings.

2. Although technology has changed, our ability to create, print and share information still lags behind, thus necessitating our need for scaled objects.

3. Part of interior design is about understanding and judging what makes a creative and effective design

– ***The Theory of Design***

4. The other part is about the practical skills needed to convey your ideas

– ***Visual Communication in Design***



ALDO ROSSI DRAWING- MODENA CEMETARY

Architect Aldo Rossi is known for his whimsical and expressive drawings

<https://www.pritzkerprize.com/biography-aldo-rossi>