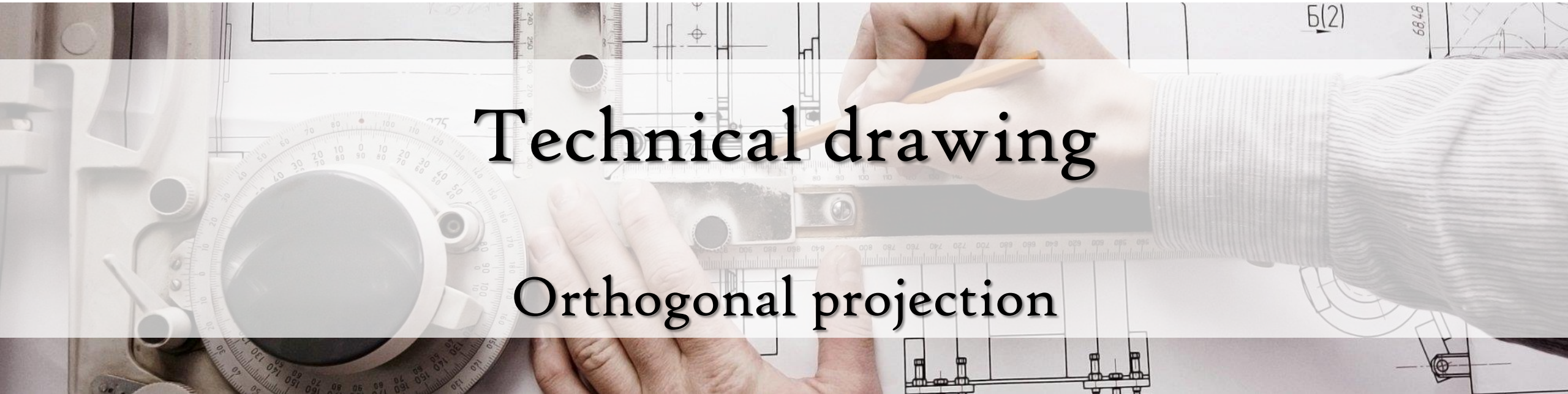


Workshop – 1st year

26/11/2023



Technical drawing

Orthogonal projection

Sectional Views

1. Definition:

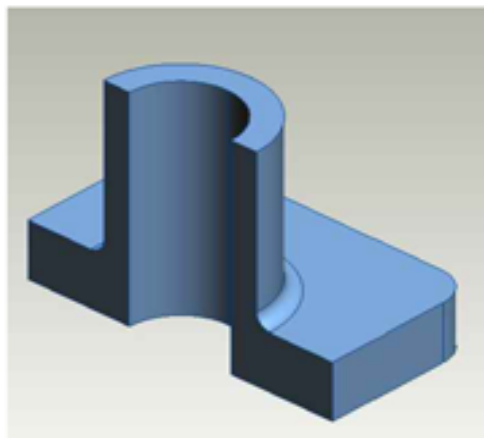
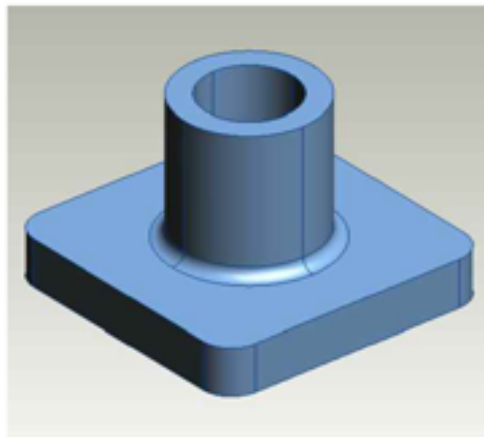
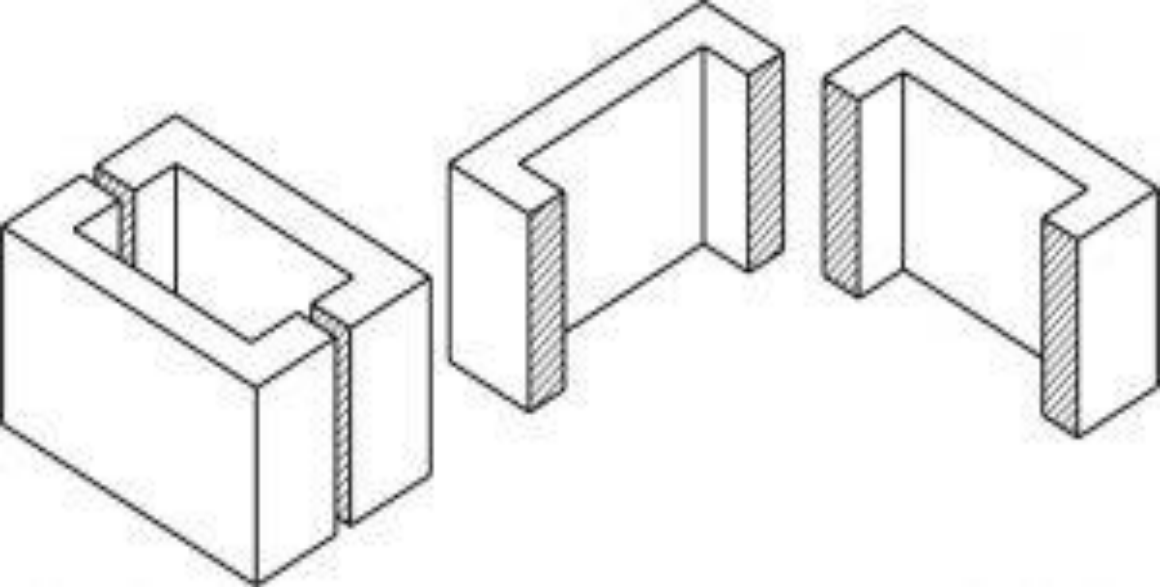
“A section is an **imaginary cut** taken **through** an **object to reveal the shape** or **interior construction**”.

That means:

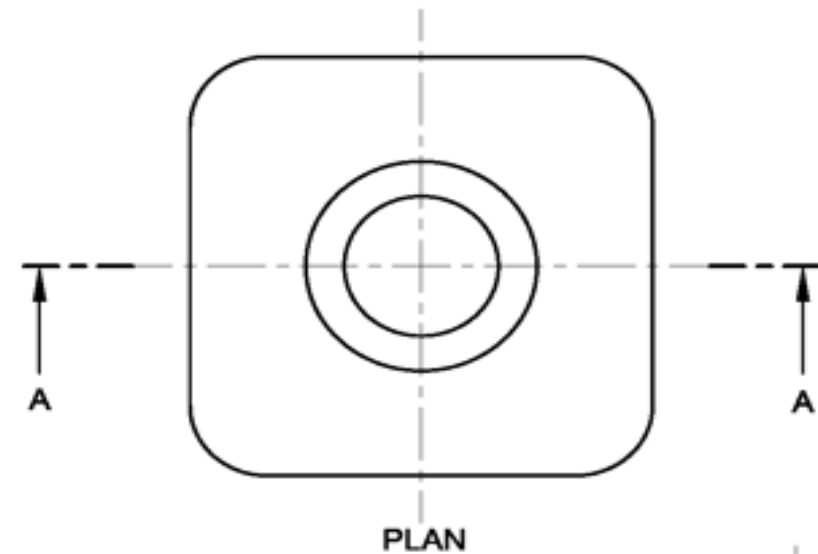
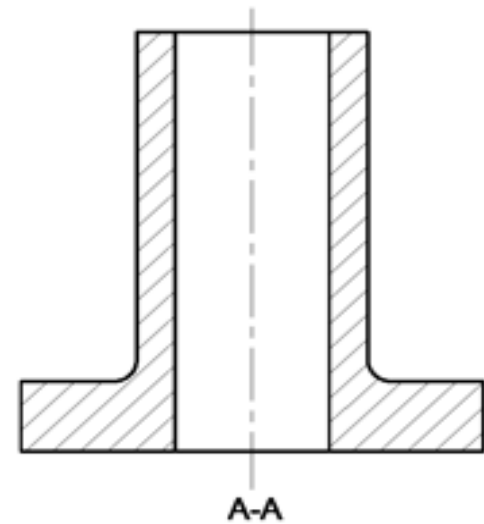
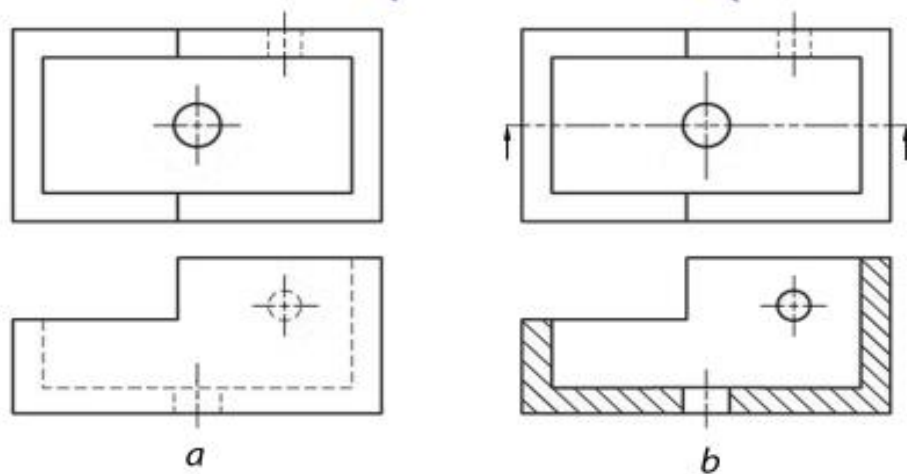
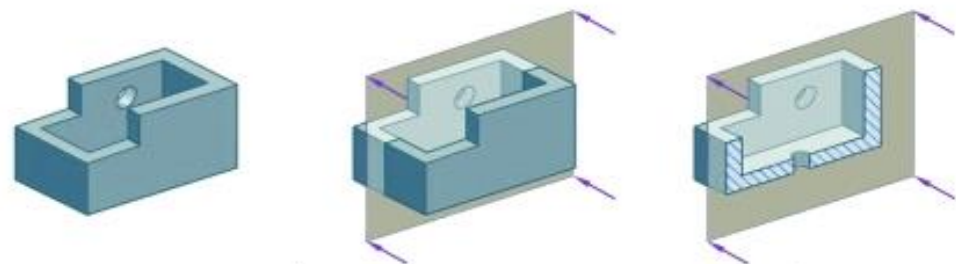
A sectional view or a section looks inside an object.

But, How does it work exactly?

1. Sectional views are used to show the interior of an object.
2. Section views are obtained by cutting the object by a plane.
 3. The part is cut using an imaginary cutting plane.
4. The unwanted portion is mentally discarded exposing the interior construction.
5. A sectional view must show which portions of the object are solid material and which are spaces. This is done by section lining (cross-hatching) the solid parts with uniformly spaced thin lines generally at 45° .



Cross-section view of a pipe bracket



2. Elements of sectional views

Elements of sectional views

```
graph LR; A[Elements of sectional views] --- B[Cutting plane]; A --- C[Cutting plane line]; A --- D[Section lining];
```

Cutting plane

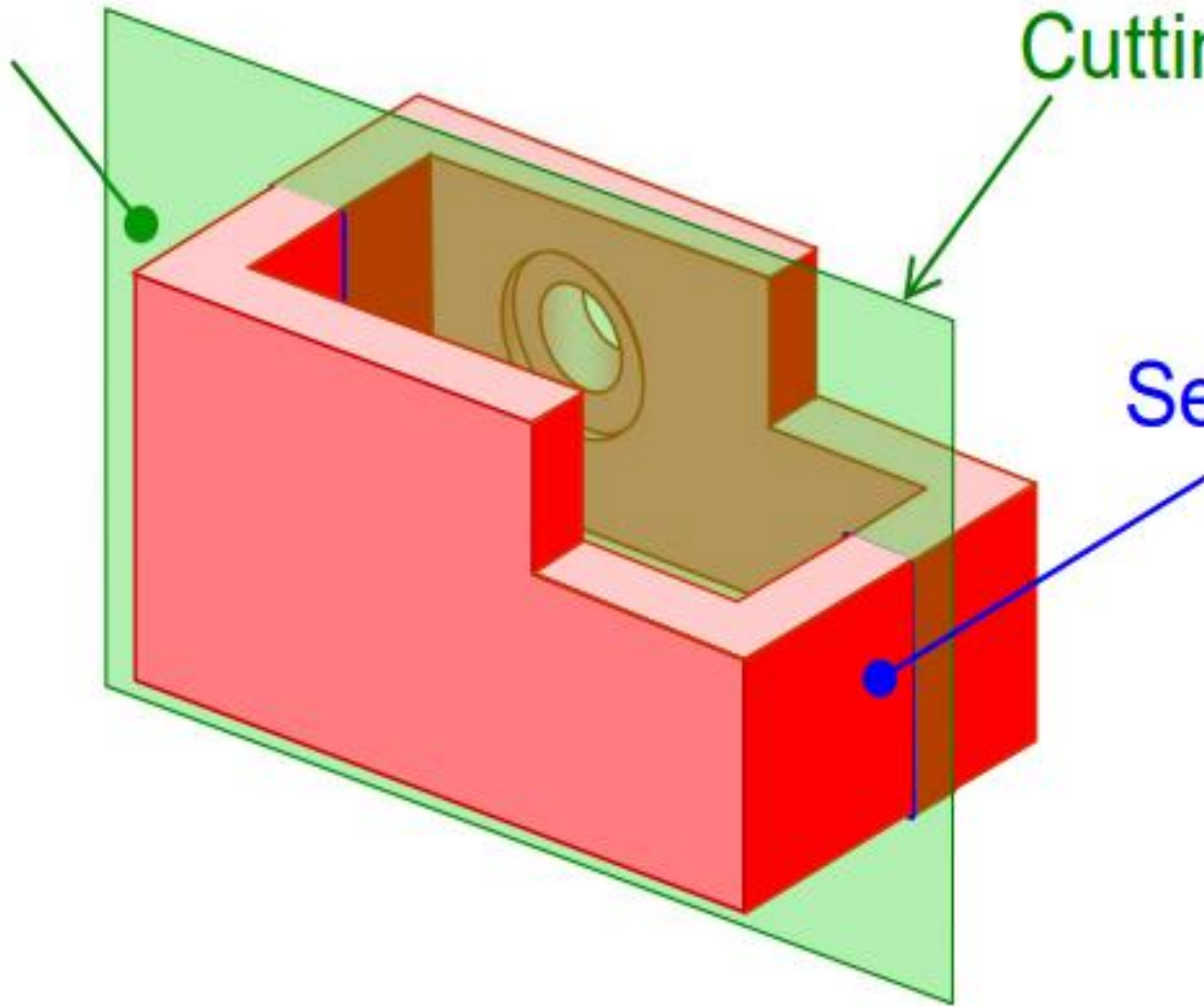
Cutting plane line

Section lining

Cutting plane

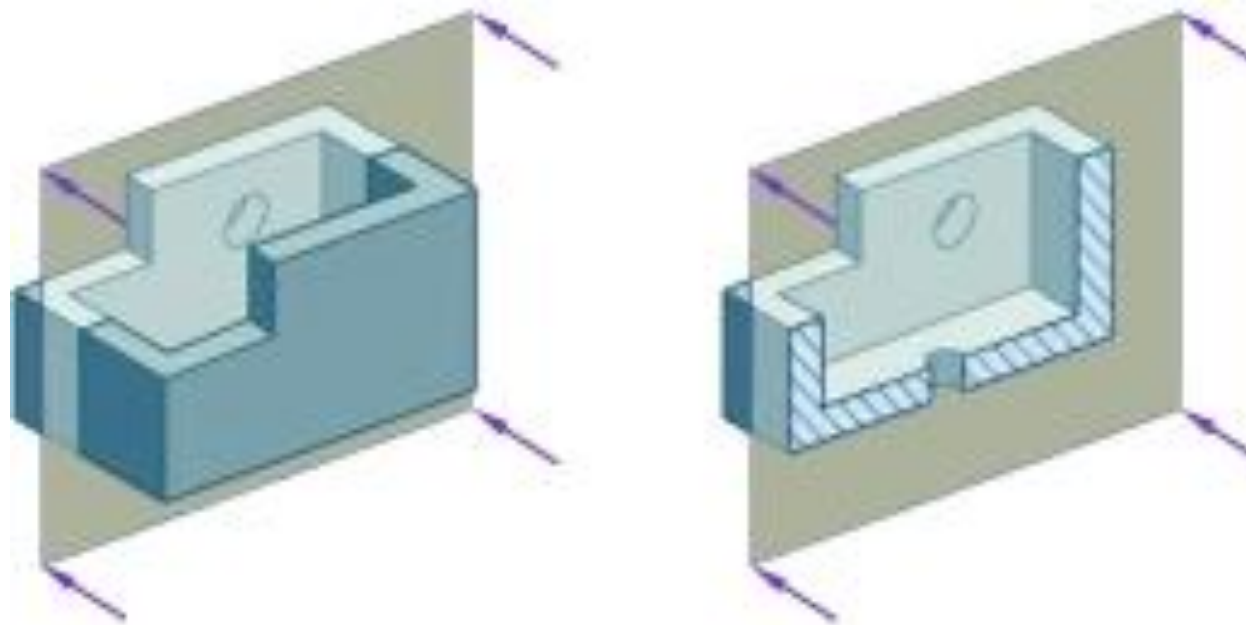
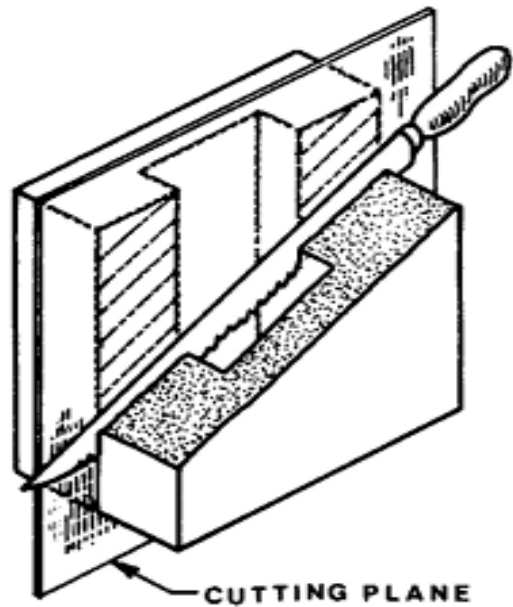
Cutting plane line

Section lines

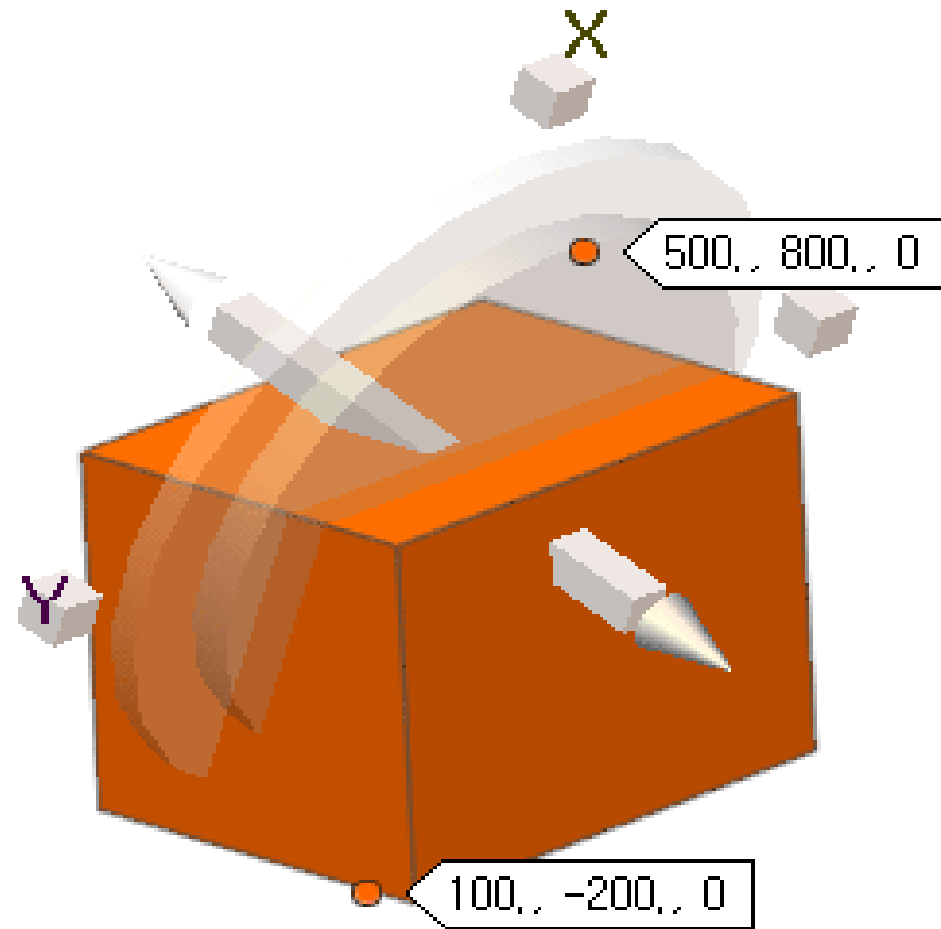


2.1. Cutting plane

“A Cutting Plane is an imaginary surface that shows the cross section of an object and it allows the observer to see the hidden inside of that object”

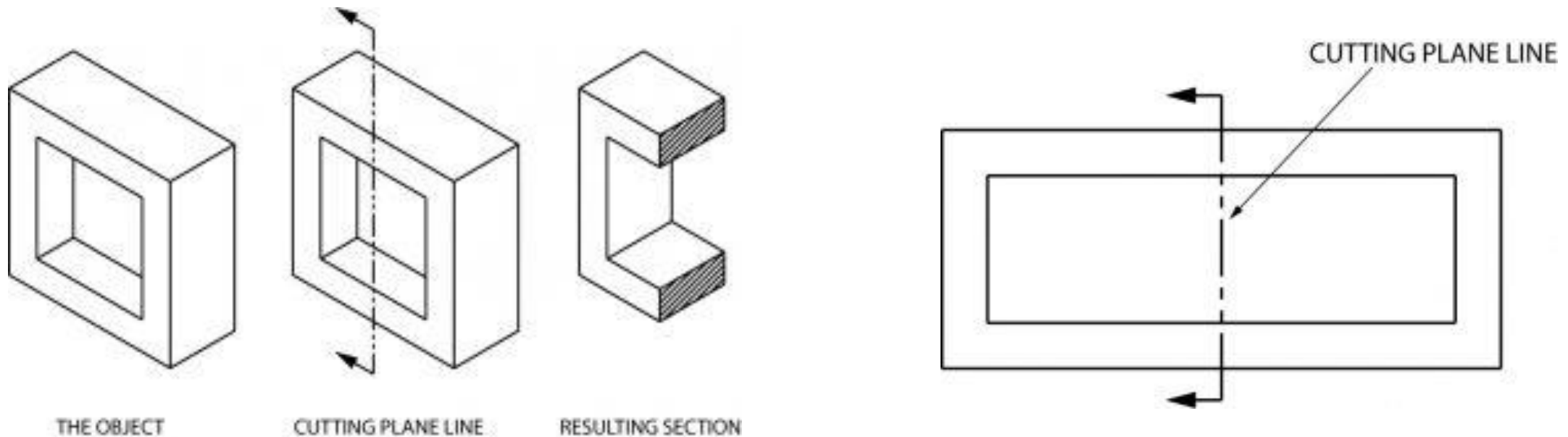


Cutting Plane OFF



2.2. Cutting plane Line

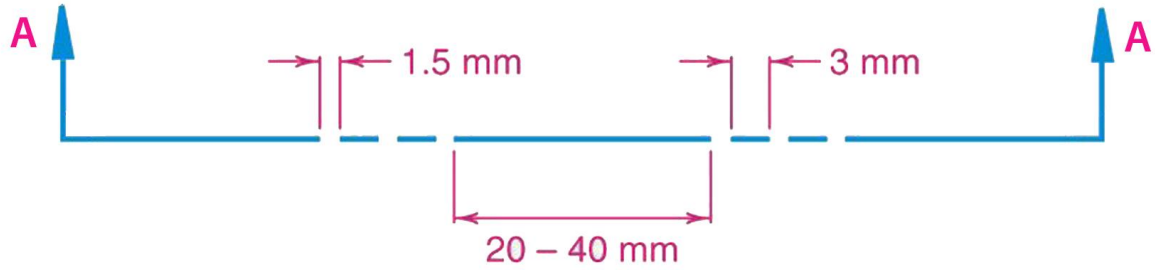
A **cutting plane line** is used to represent the **cutting plane**. It is a **heavy long-short-short-long kind of line terminated with arrows**. The arrows show the direction of view.



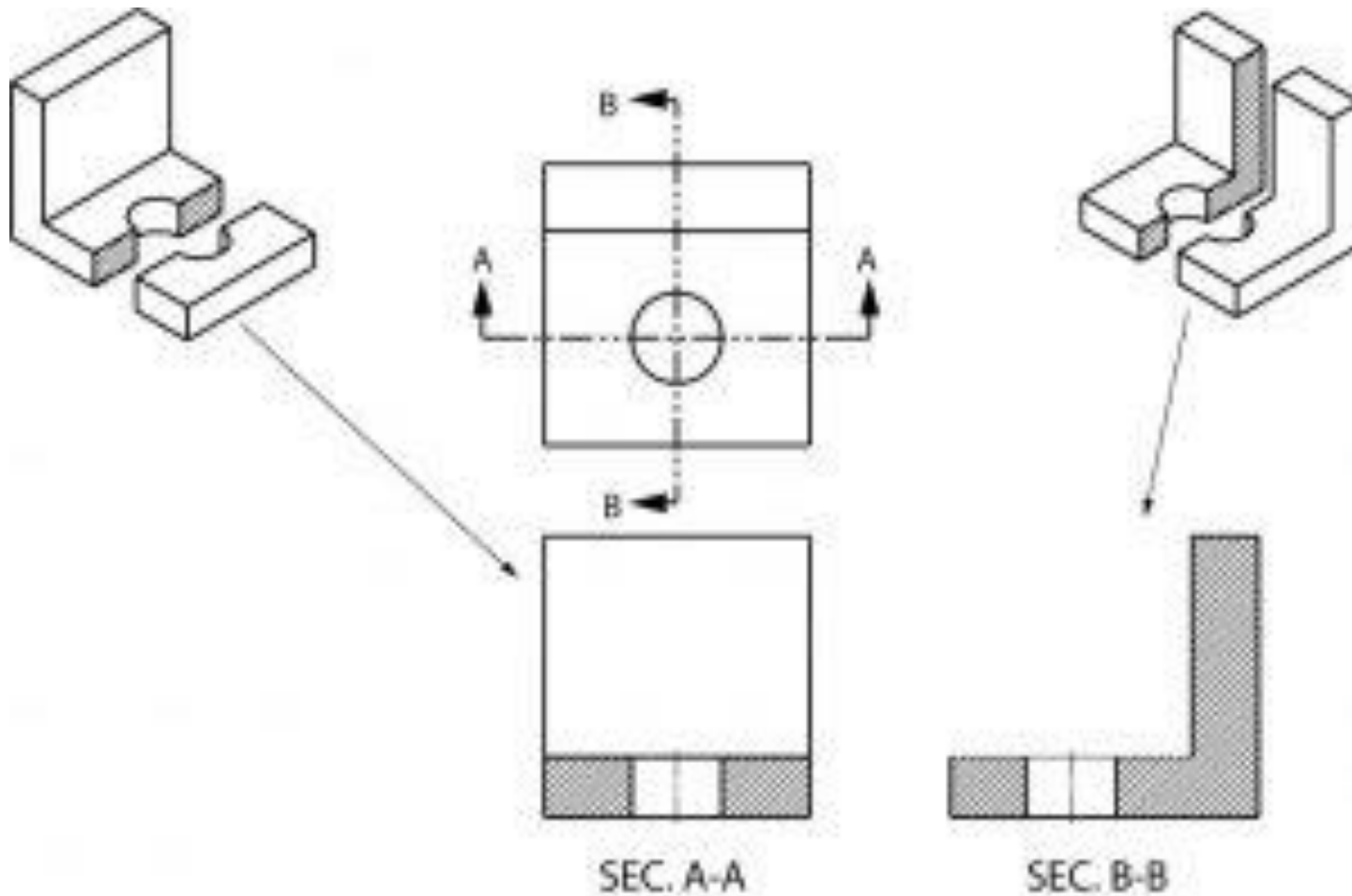
Example of a cutting plane line and the section that develops from it

2.3. Section Lining

- Section lines, or hatching (...) **represent the cut surface.**
- They usually consist of **thin parallel lines** (...) drawn at an angle of approximately 45° to the principal edges or axes of the part.



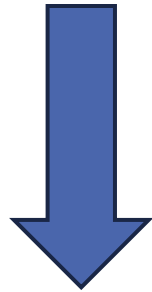
Cutting plane lines are thick (0.6 mm) dashed lines, that extend past the edge of the object 6mm (1/4") and have line segments at each end drawn at 90 degrees and terminated with arrows.



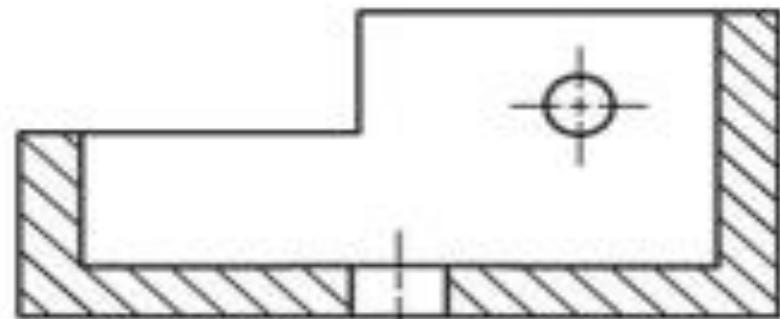
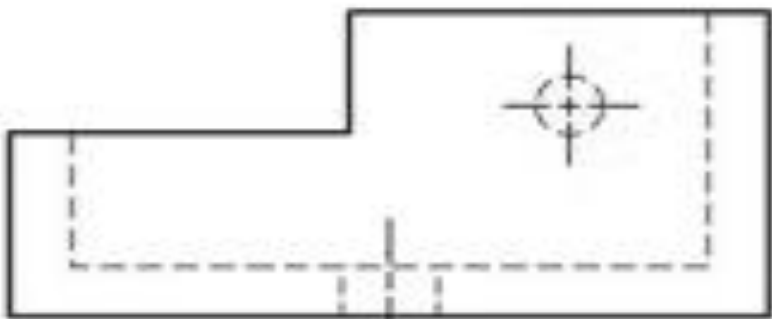
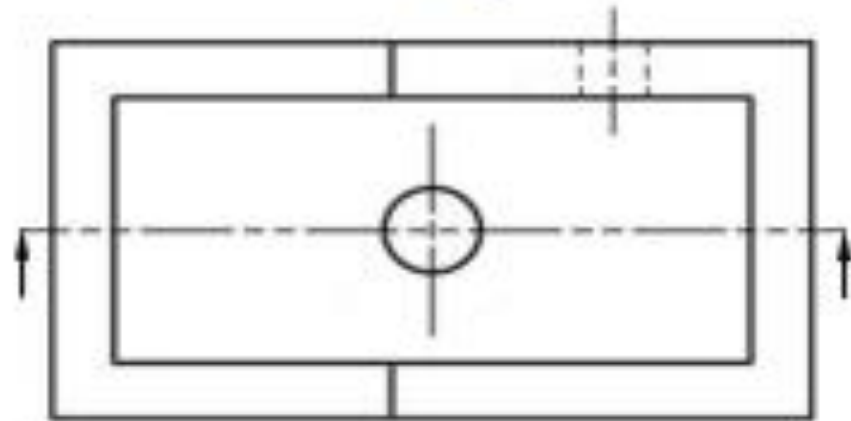
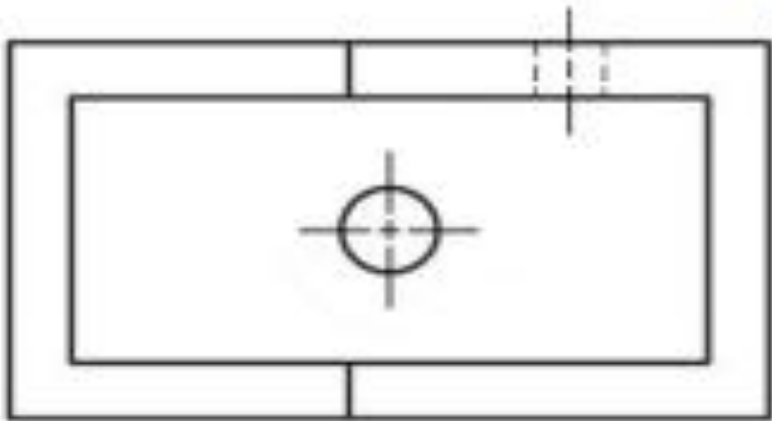
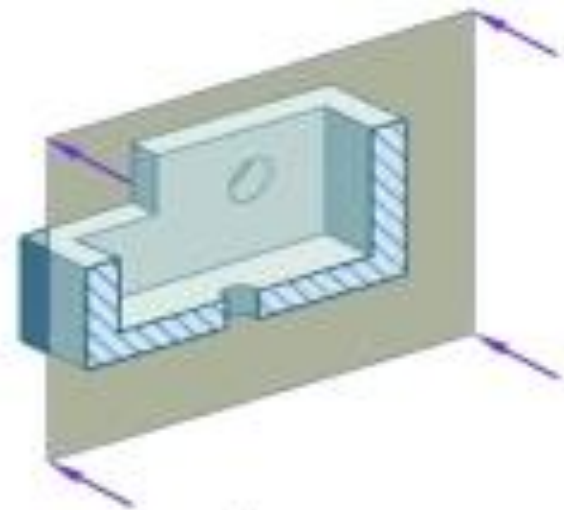
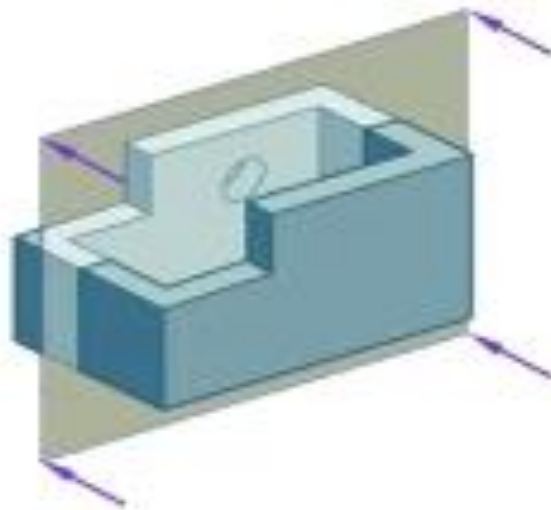
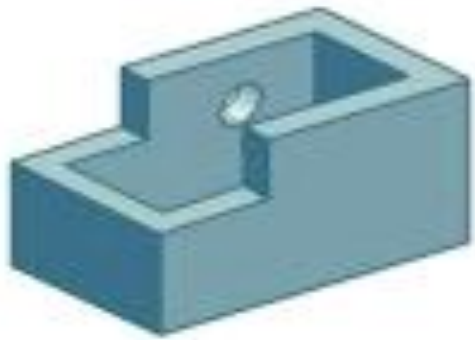
Multiple sections can be done on a single object.

3. How to create a sectional view

1. Take an imaginary cut through the object
 2. Remove a portion

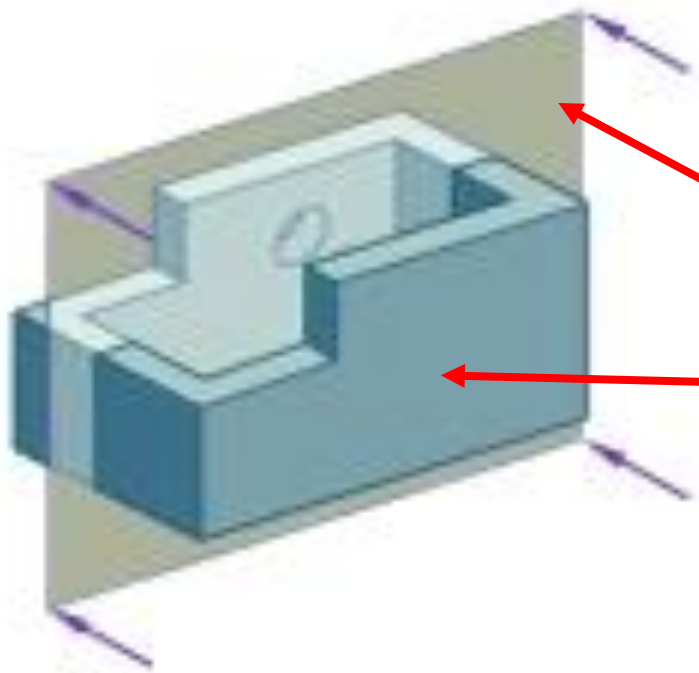


The inside features may be seen more clearly



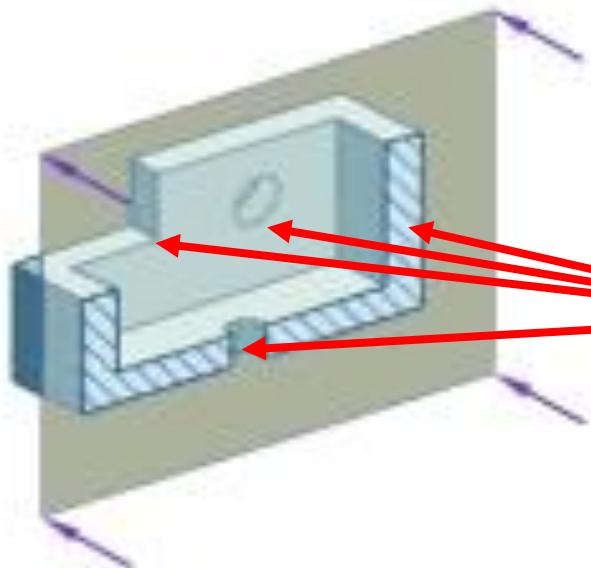
a

b

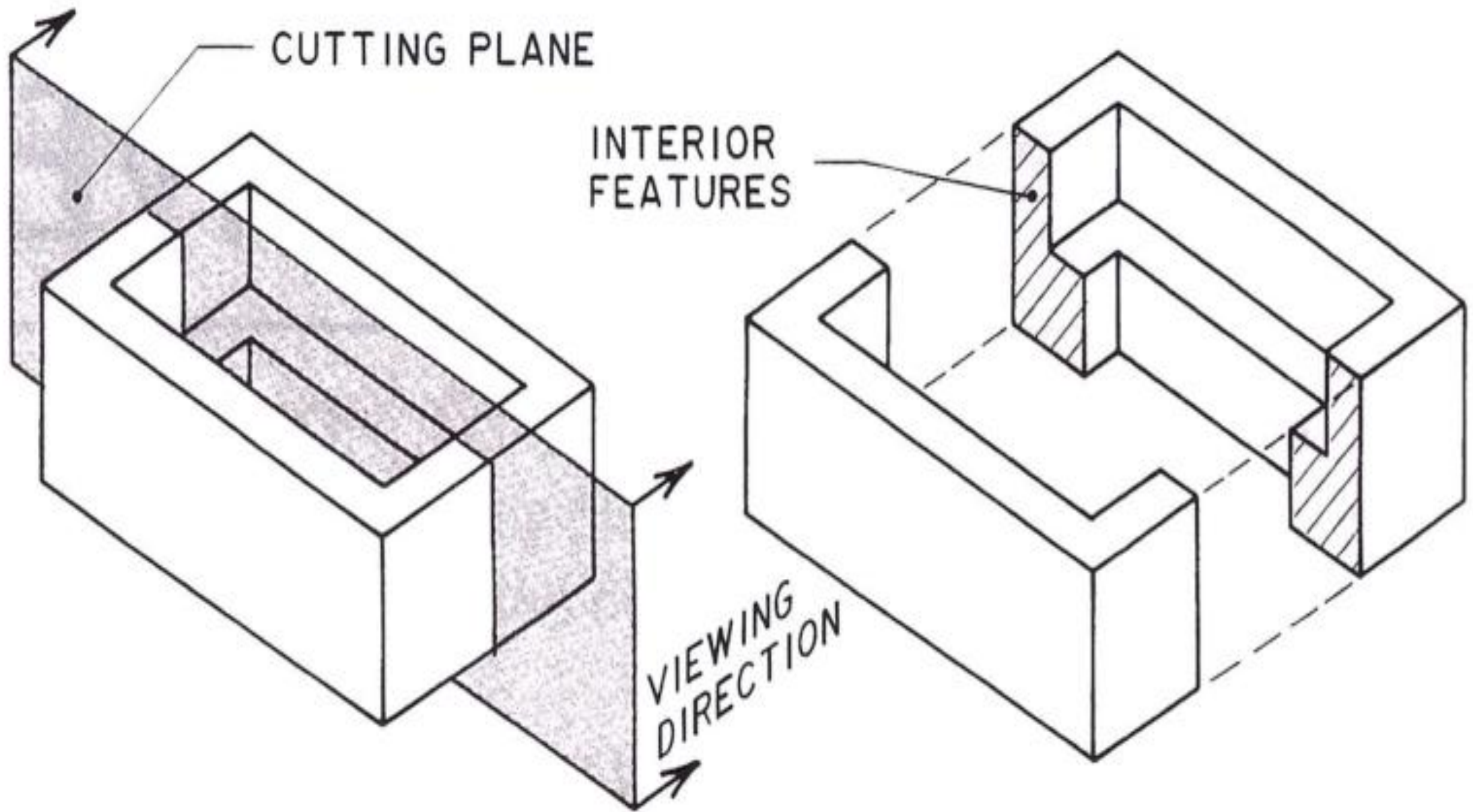


1. Take an imaginary cut through the object

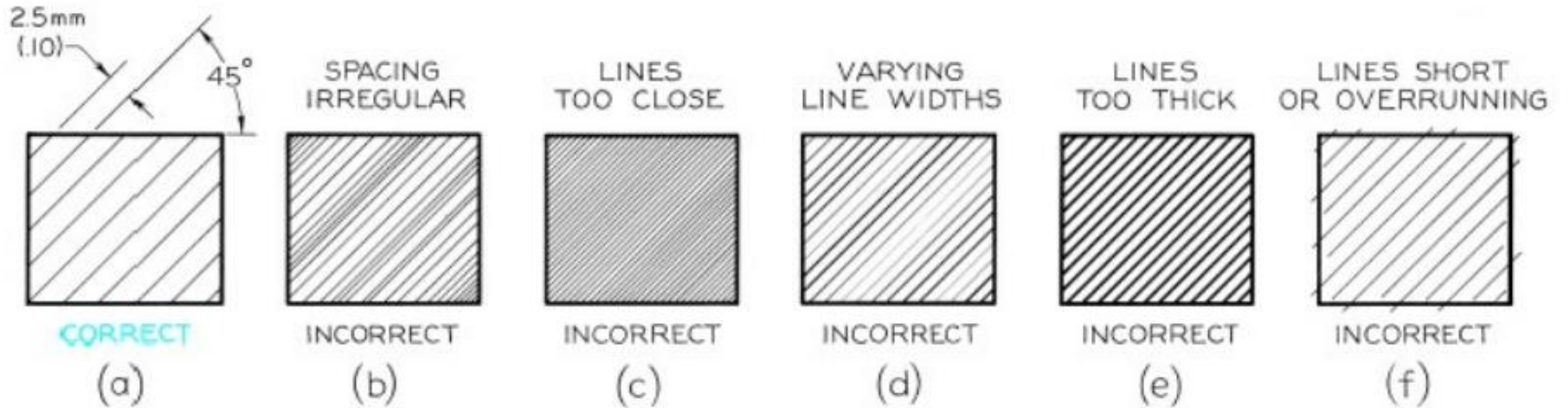
2. Remove a portion



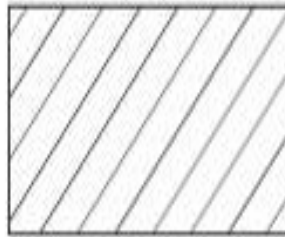
The inside features may be seen more clearly.



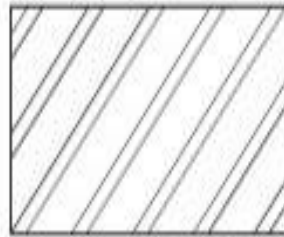
4. Section Lining techniques



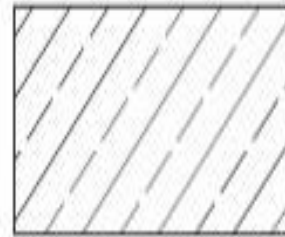
5. Section lines and symbols



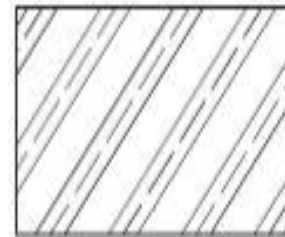
(A) Cast or malleable iron and general use for all materials



(B) Steel



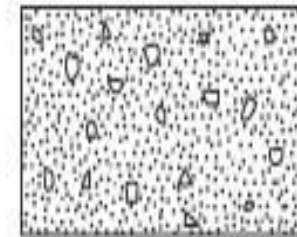
(C) Bronze, brass, copper, and compositions



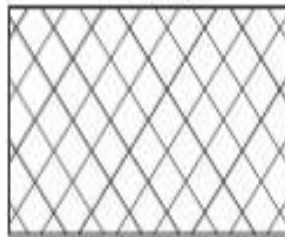
(J) Titanium and refractory material



(K) Electric windings, electromagnets, resistance, etc.



(L) Concrete



(D) White metal, zinc, lead, babbitt, and alloys



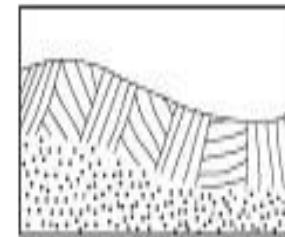
(E) Magnesium, aluminum, and aluminum alloys



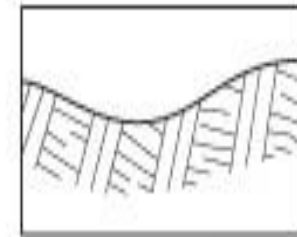
(F) Rubber, plastic, and electrical insulation



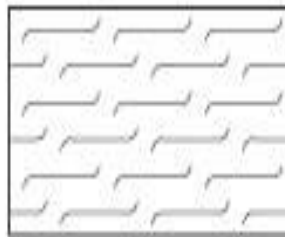
(M) Marble, slate, glass, porcelain, etc.



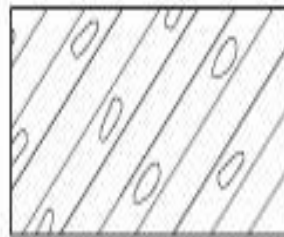
(N) Earth



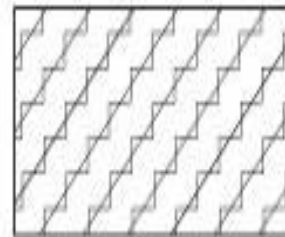
(O) Rock



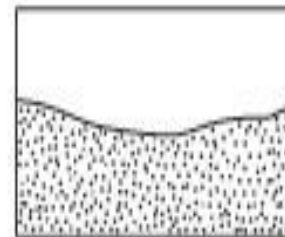
(G) Cork, felt, leather, and fiber



(H) Sound insulation



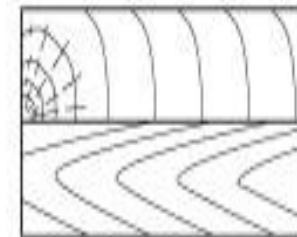
(I) Thermal insulation



(P) Sand



(Q) Water and other liquids

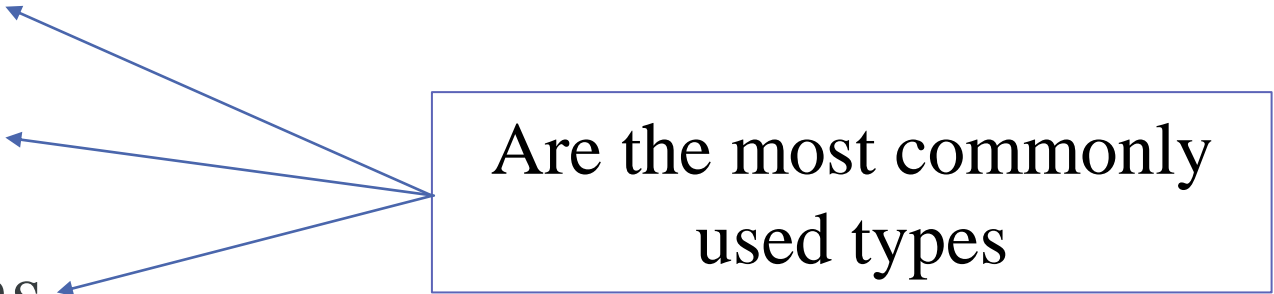


(R) Across grain > Wood
With grain

6. Types of sections

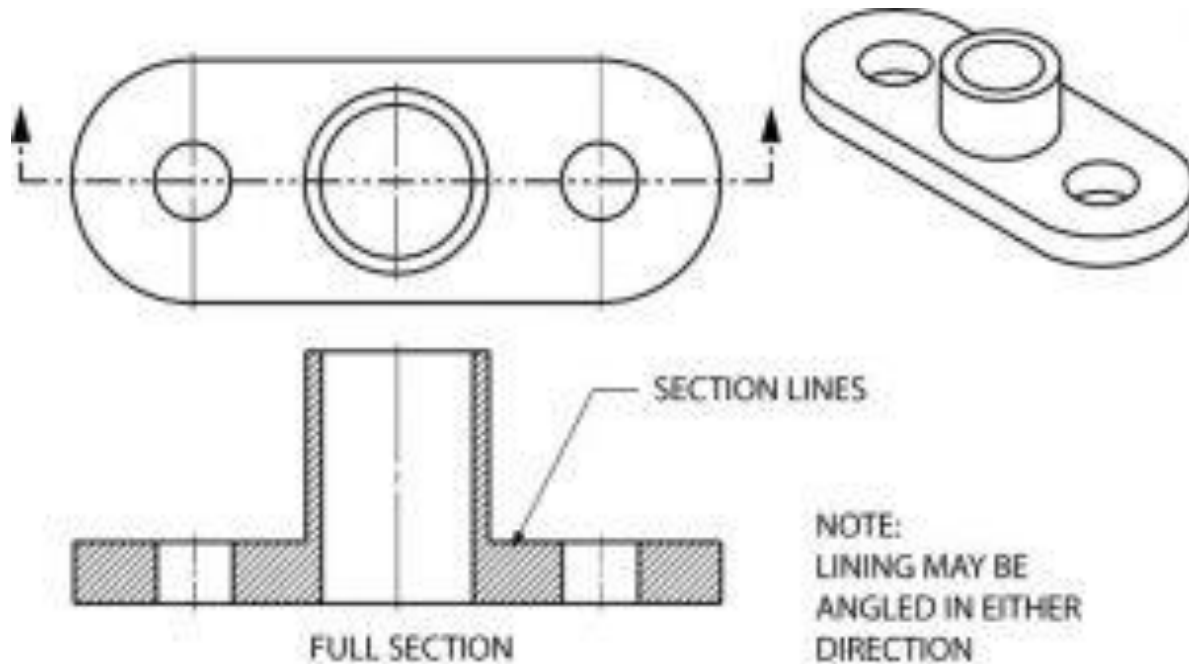
1. Full sections
2. Half sections
3. Offset sections
4. Broken out sections
5. Revolved sections
6. Removed sections

Are the most commonly used types



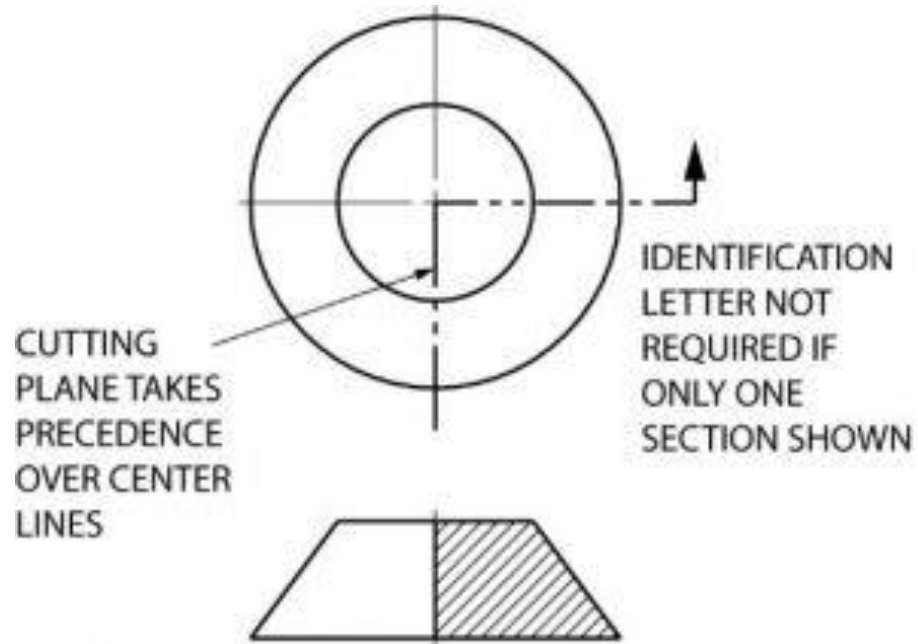
6.1. Full Sections

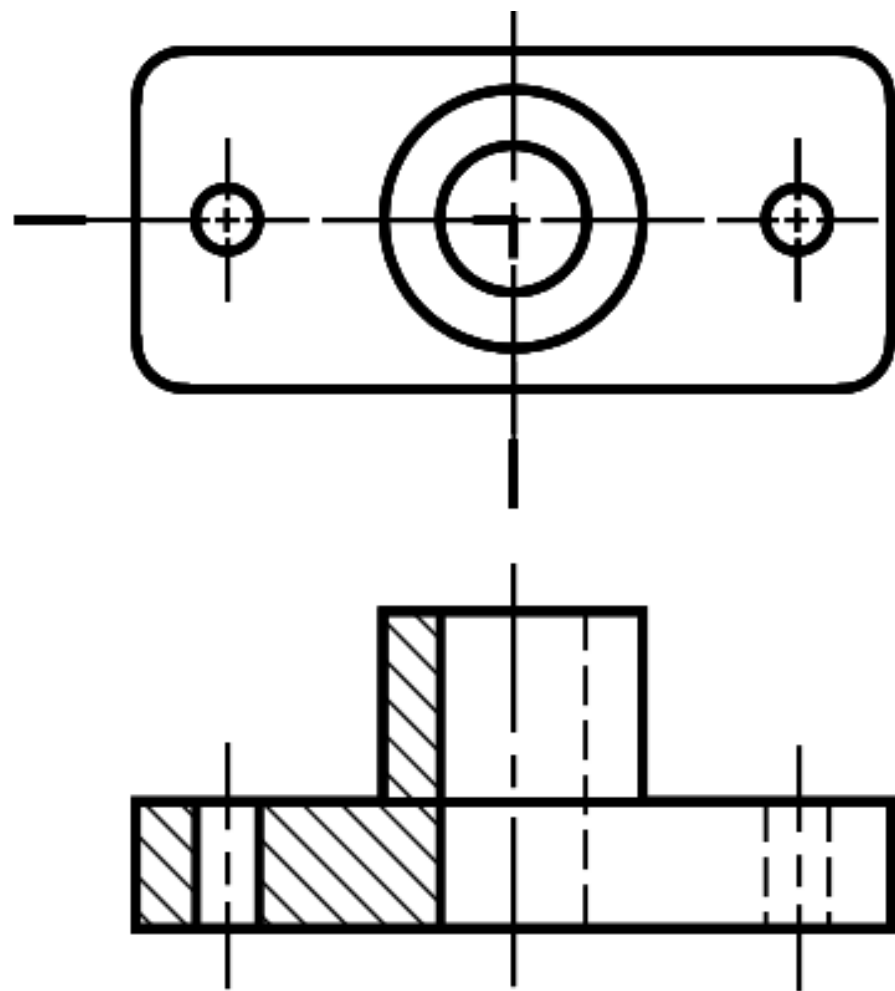
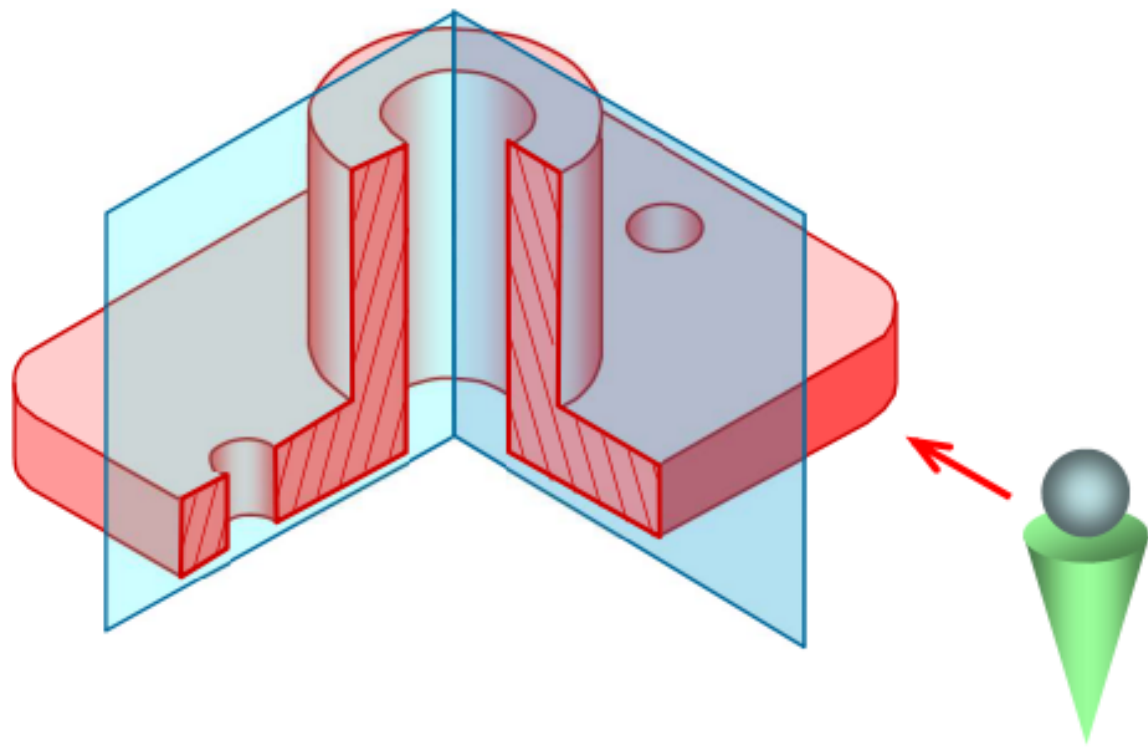
- ▶ When a cutting plane line passes entirely through an object.



6.2. Half Sections

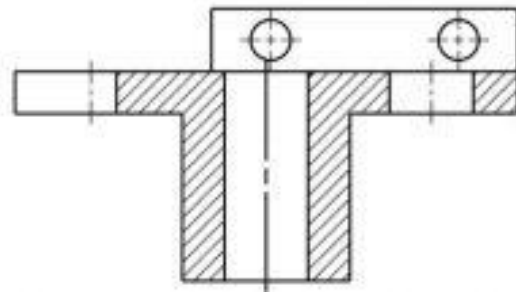
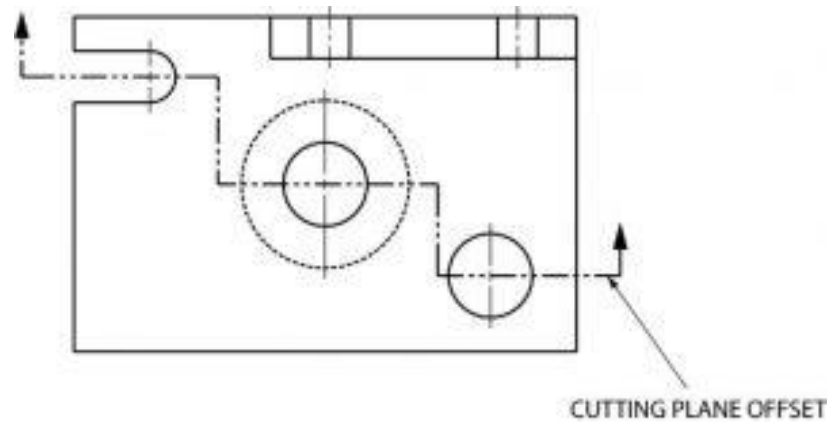
- ▶ If the cutting plane is passed halfway through an object, and one-quarter of the object is removed, the resulting section is a half section. A half section has the advantage of showing both inside and outside configurations.





6.3. Offset Sections

- ▶ An offset section is a means of including in a single section several features of an object that are not in a straight line. To do this, the cutting plane line is bent, or “OFFSET” to pass through the features of the part.



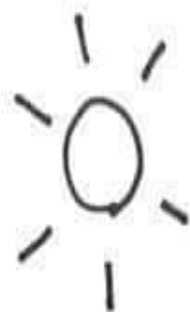
7. Sectional views in urban planning and urban design

The sectional view is not an independent type of drawing because it can not be understood by its self. It's always combined with other types to gives more details and permits a well comprehension of the project.

Engineers and designers should use sections and sectional views in both free-hand drawing and technical drawing as follows:

7.1. Sectional views in free-hand drawing

In this type of drawing, the sectional views help to make the idea of the designer more clear and allow him/her to have a general idea of the project and how it may work with its different heights and levels.



① The SKIN protects the people and art from direct sunlight. It is a filter converting strong sunlight into ambient light.

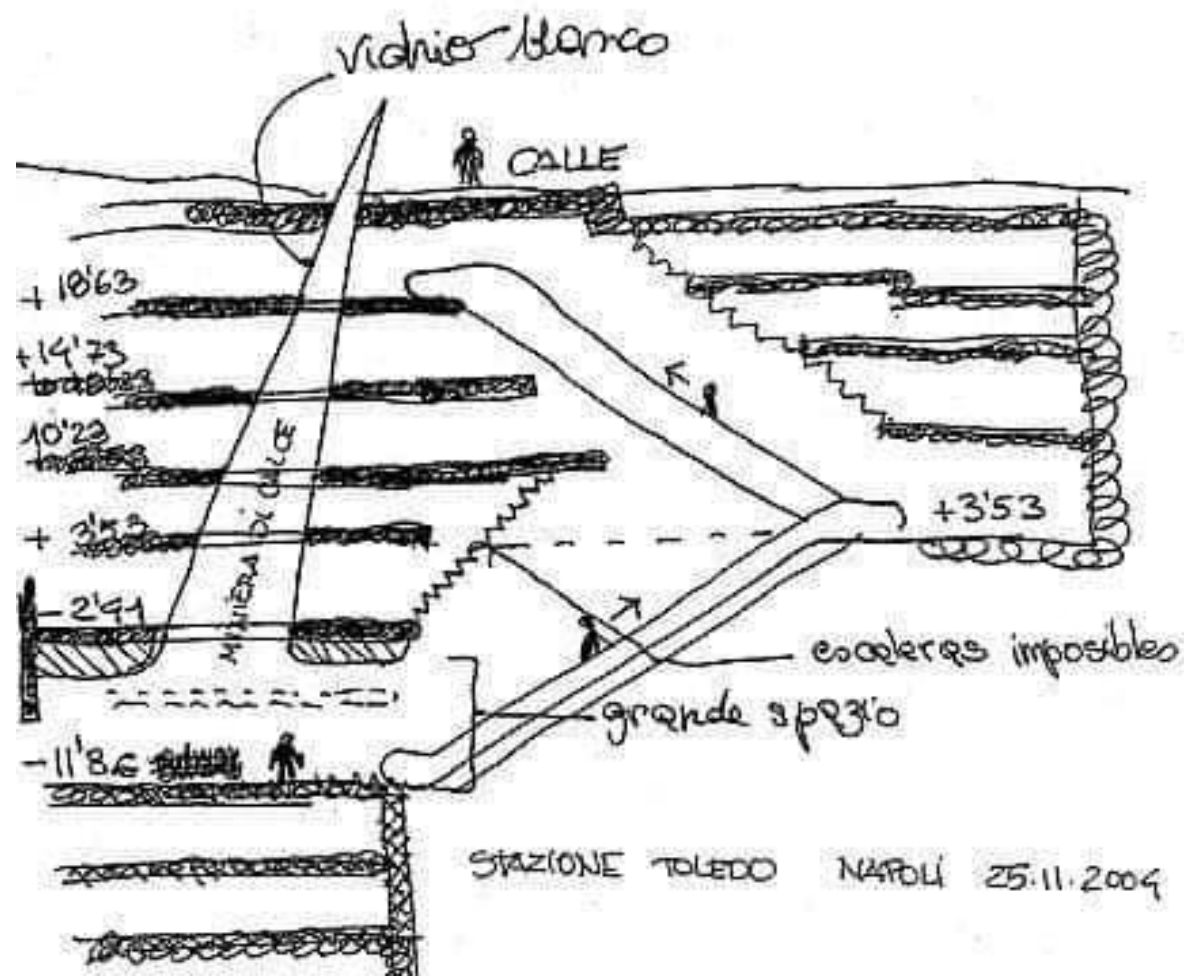
② The SKIN gently separates the outside and inside but it also brings the museum closer to the city.

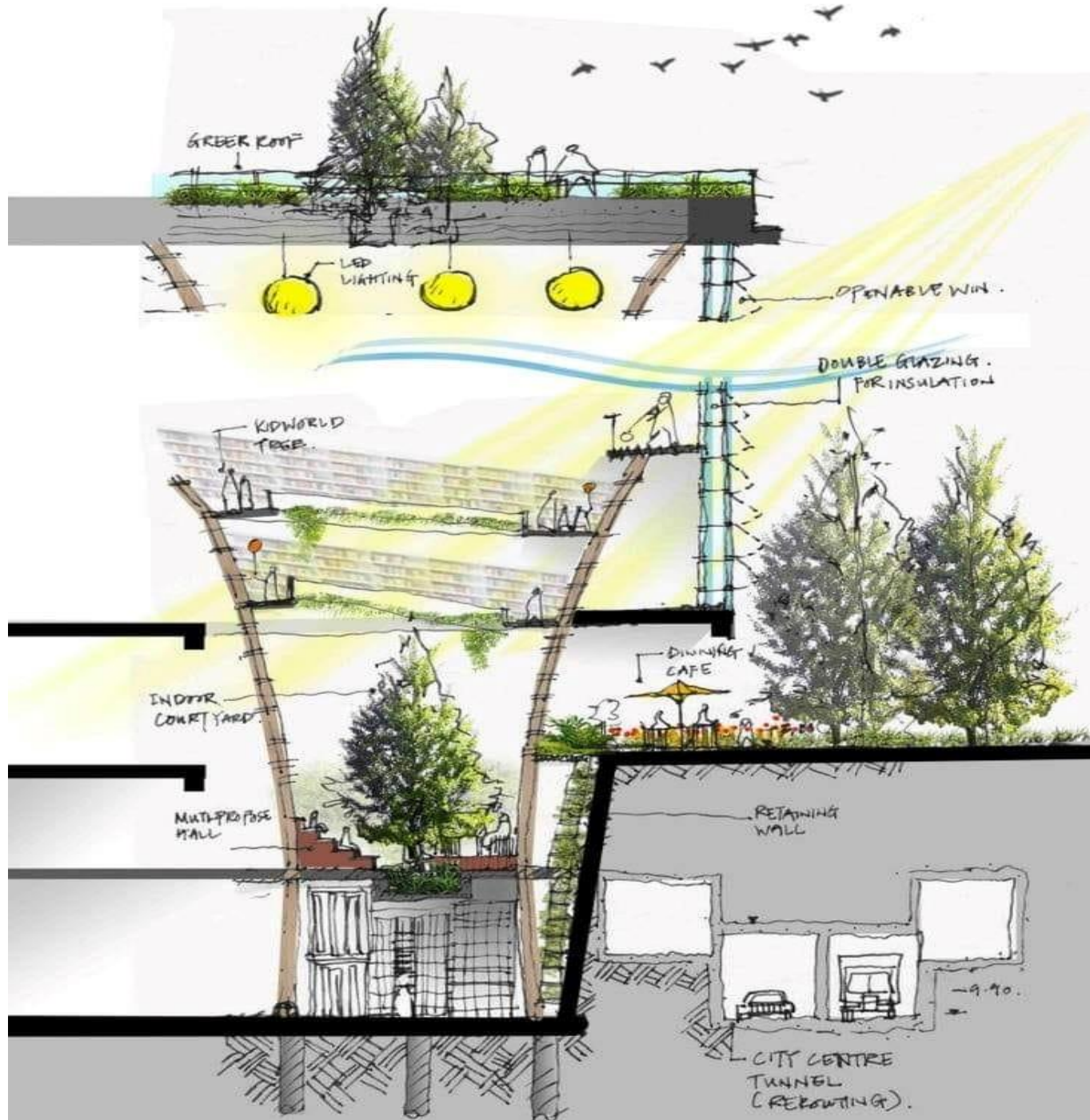
③ Sculpture garden

④ Standing on the roof, one can see the cityscape through the SKIN.

⑤ The existing IVAM can be seen through the SKIN.

⑥ The spaces between the SKIN and the existing IVAM is free public space for everyone.

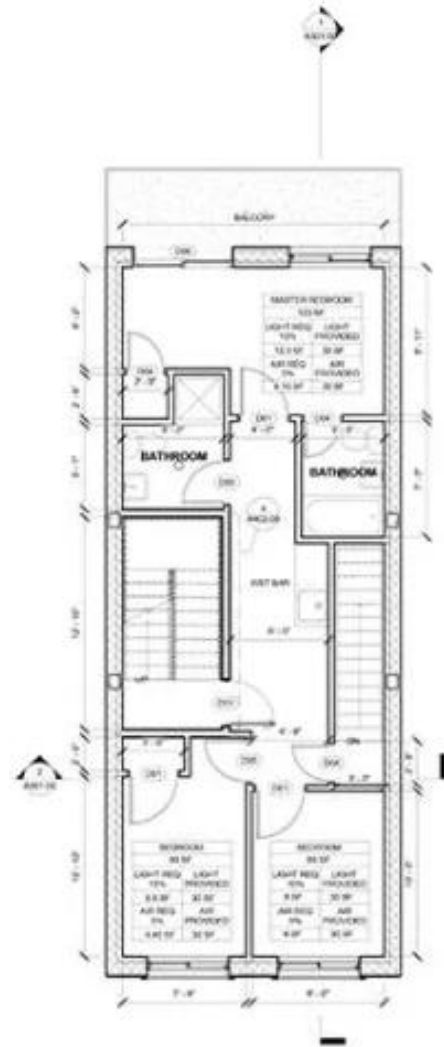




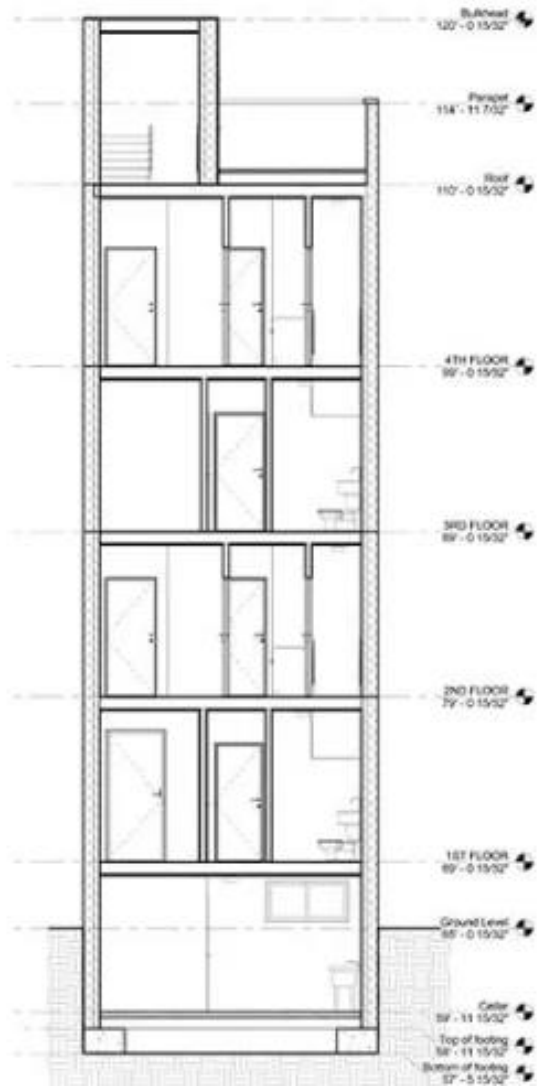
7.2. Sectional views in technical drawing

In this type of drawing, the sectional views give the correct dimensions of vertical views in building, streets and other parts of the city.

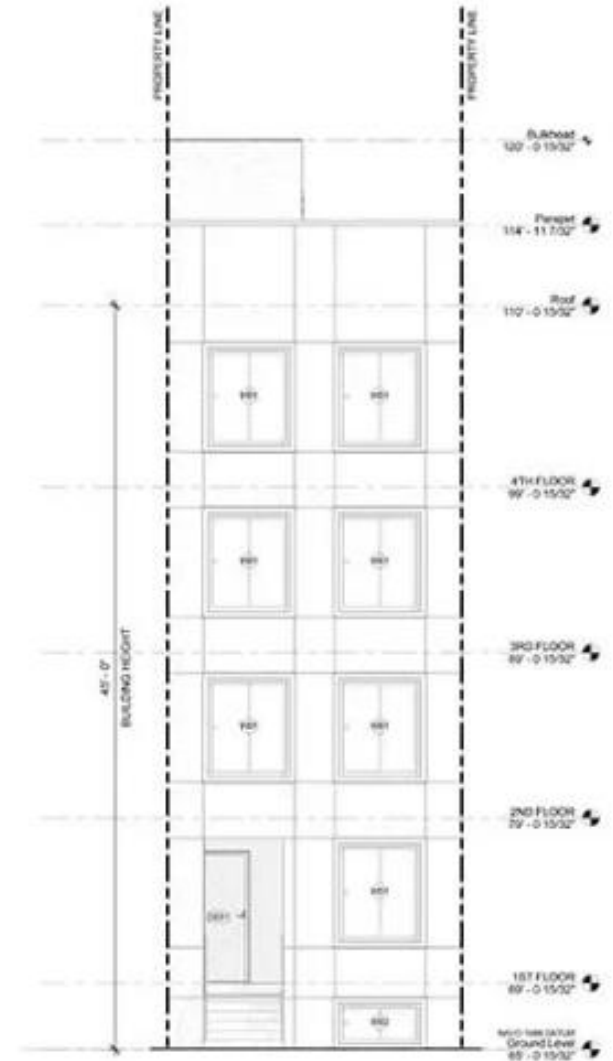
PLAN

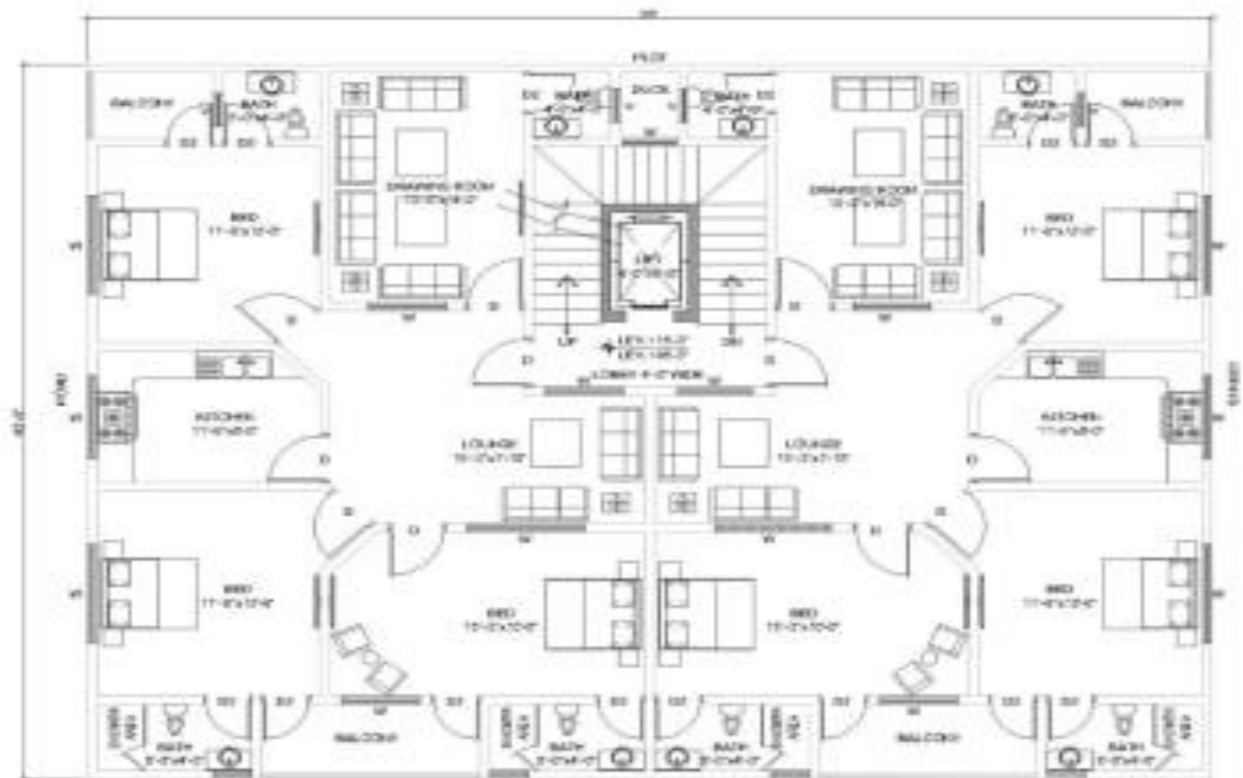


SECTION

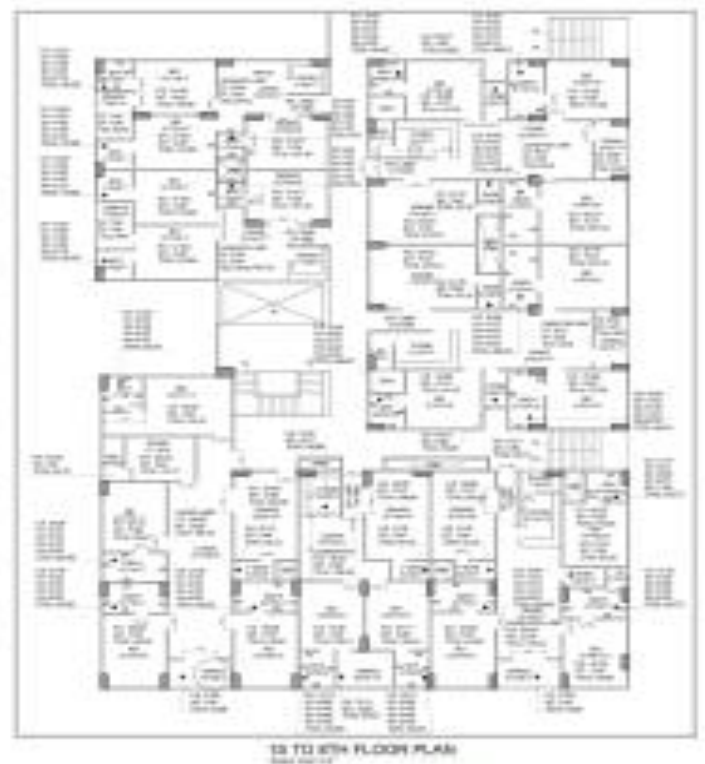
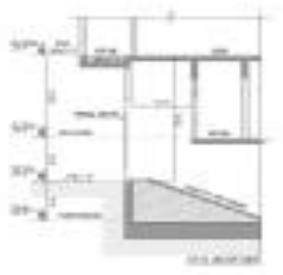
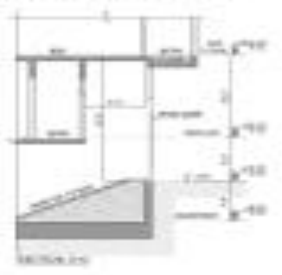


ELEVATION





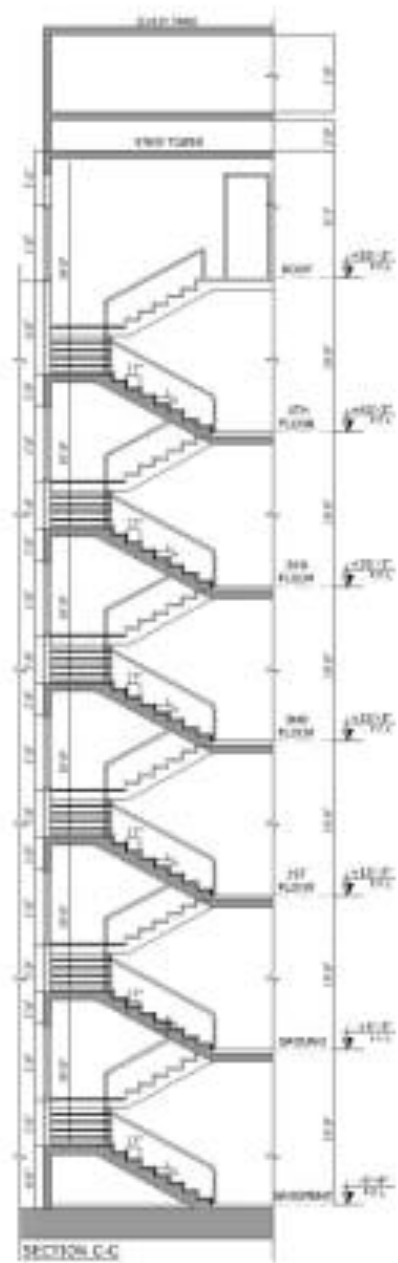
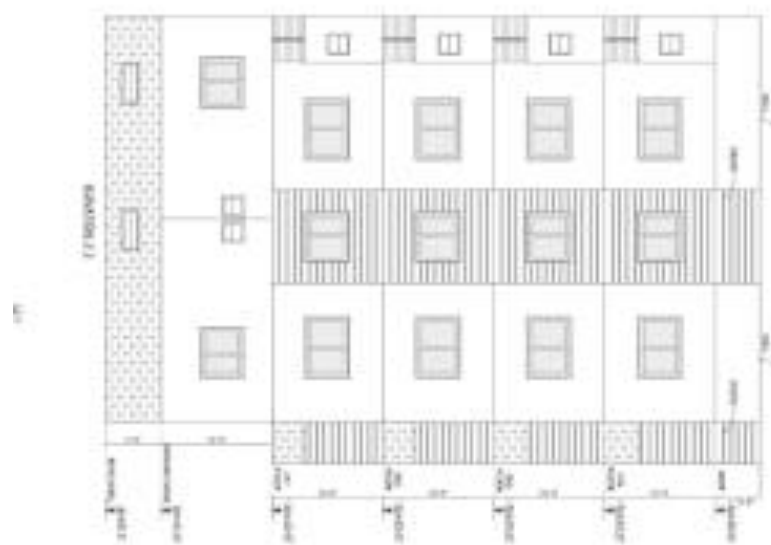
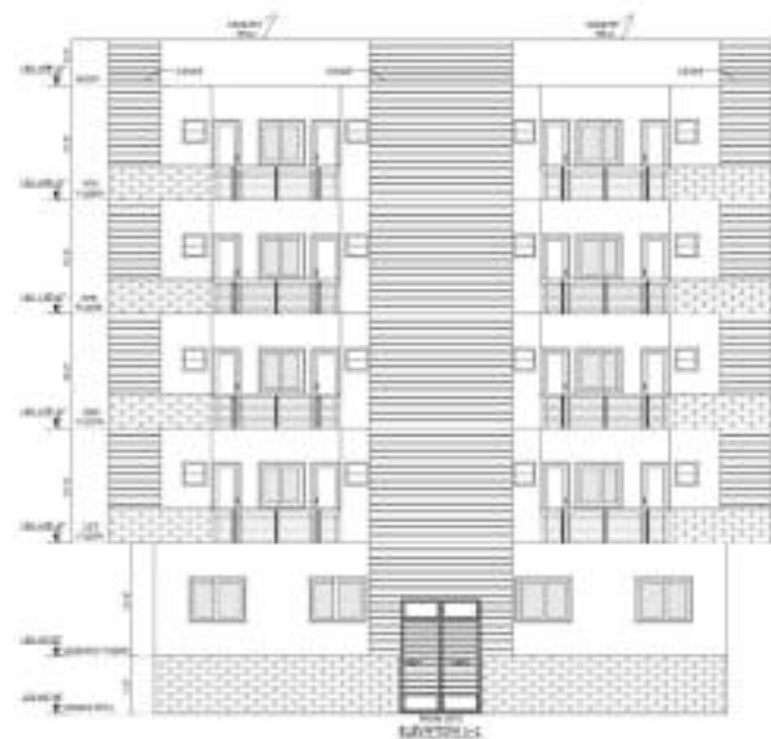
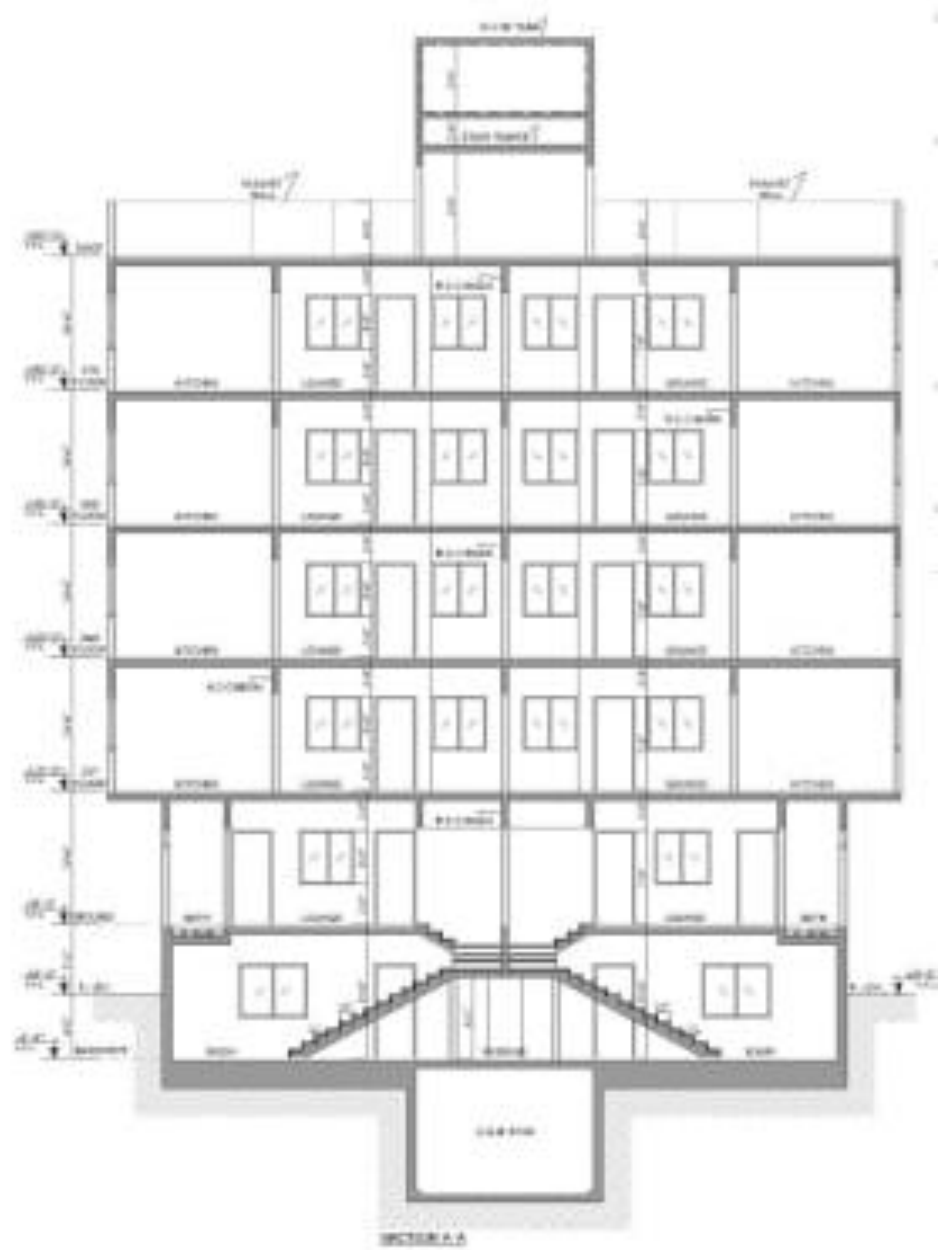
1ST TO 4TH TYPICAL FLOOR PLAN
FURNITURE PLAN



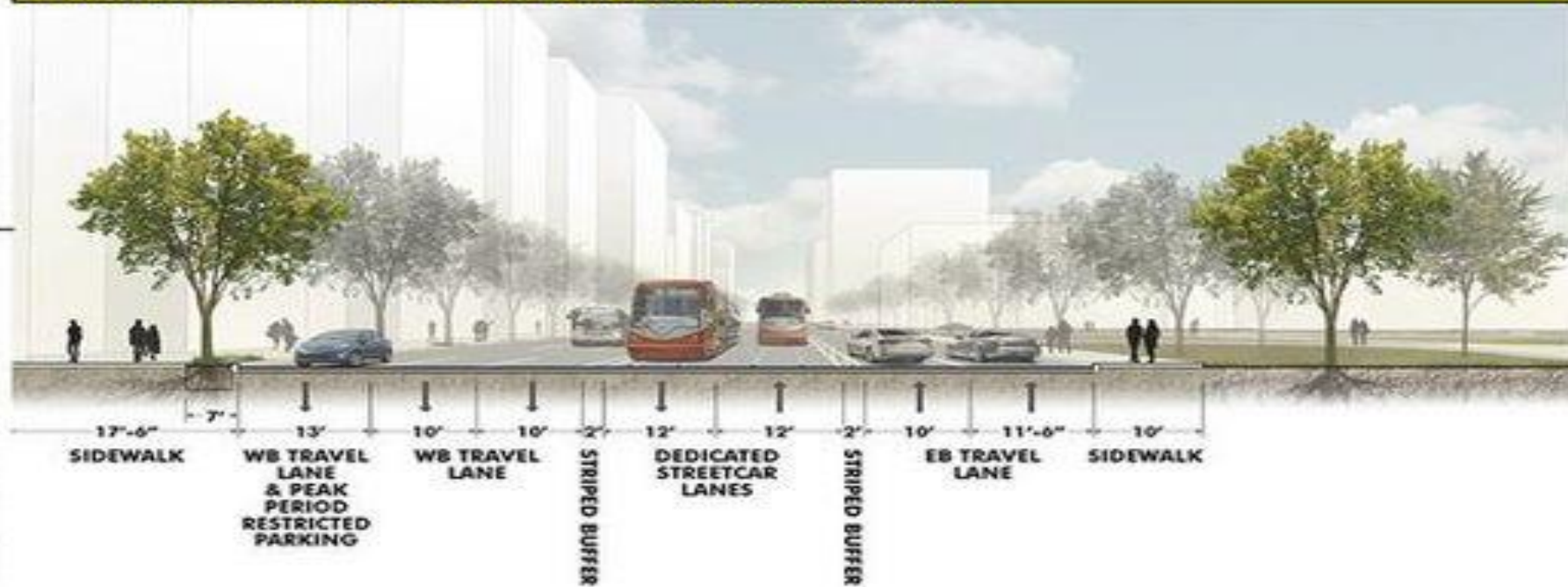
16 TO 18TH FLOOR PLAN



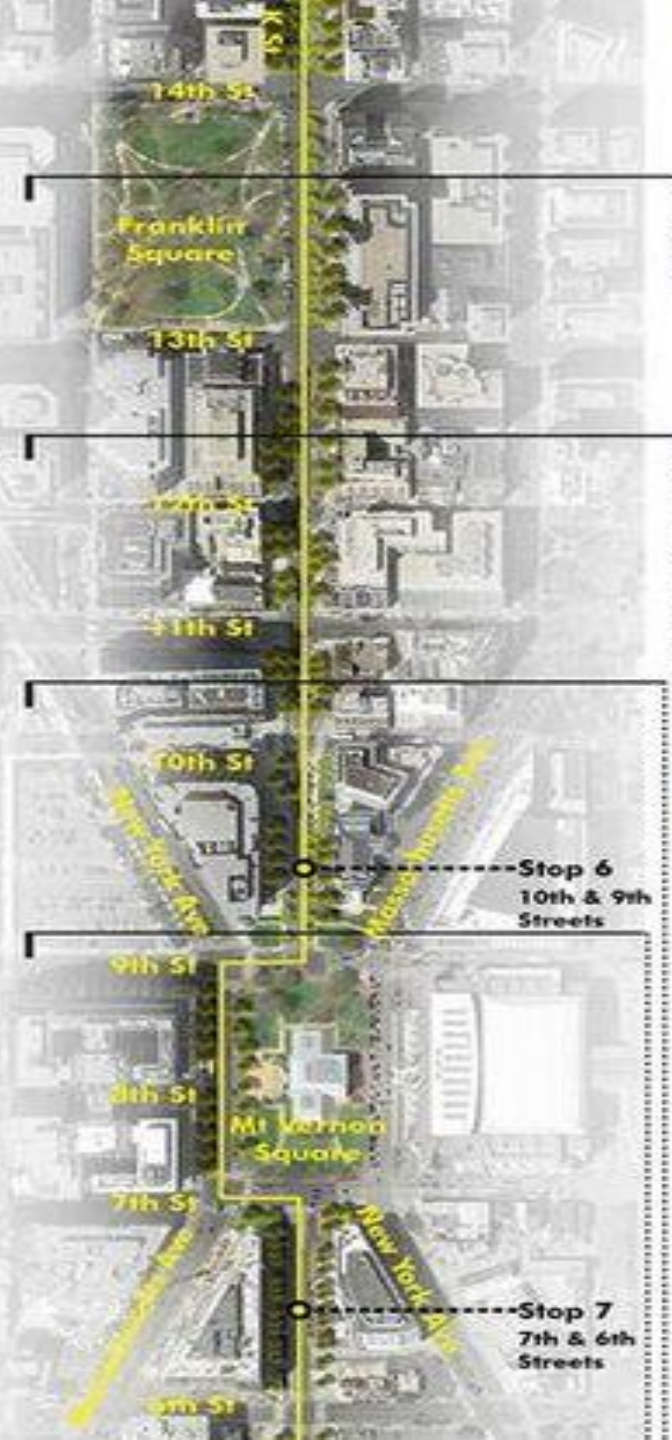
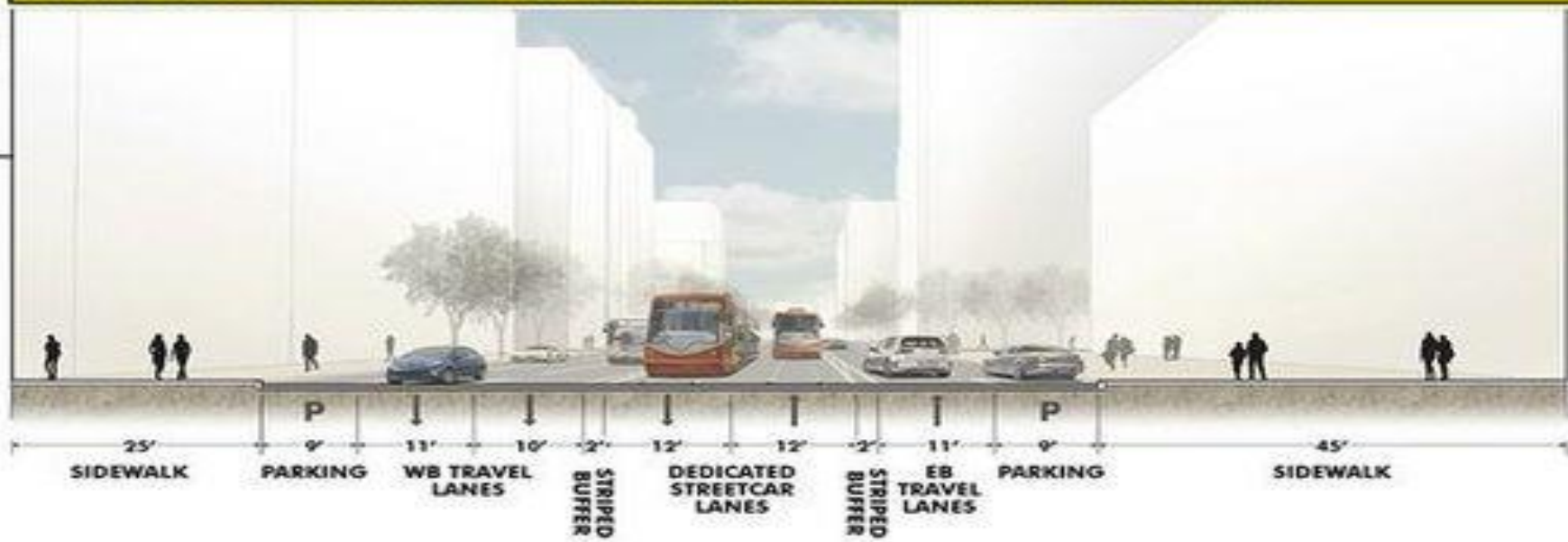
GROUND FLOOR PLAN



TYPICAL SECTION - K STREET NW AT FRANKLIN SQUARE

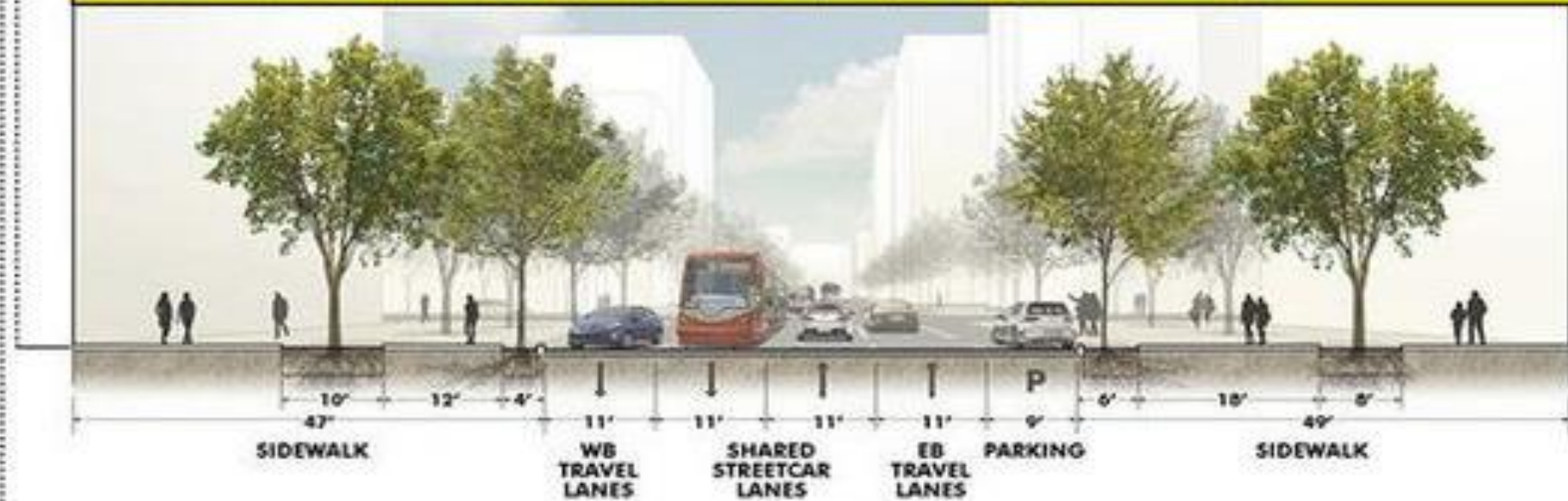


TYPICAL SECTION - K STREET NW BETWEEN 13TH STREET AND 12TH STREET

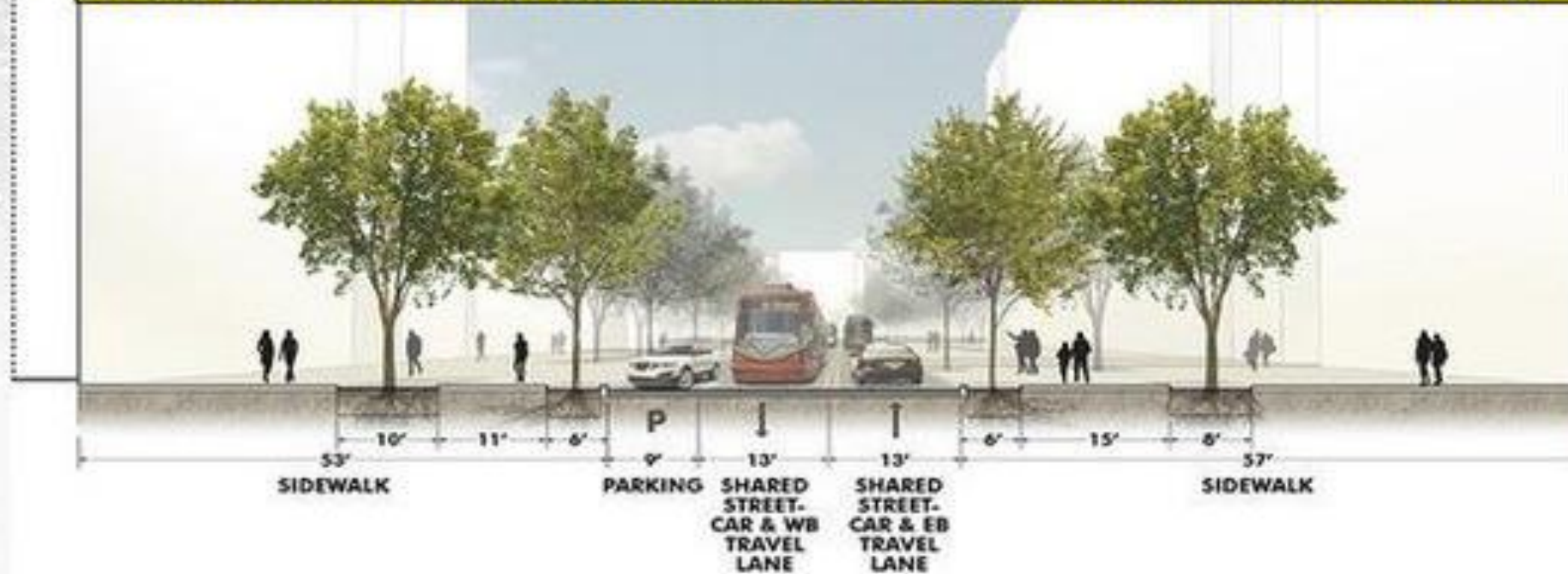




TYPICAL SECTION - K STREET NW BETWEEN 12TH STREET AND 10TH STREET



TYPICAL SECTION - K STREET NW LOOKING EAST BETWEEN 10TH STREET AND 9TH STREET



TYPICAL SECTION - K STREET NW AT FRANKLIN SQUARE



