

# Earth-science

## —Residential Planning

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## Module Content

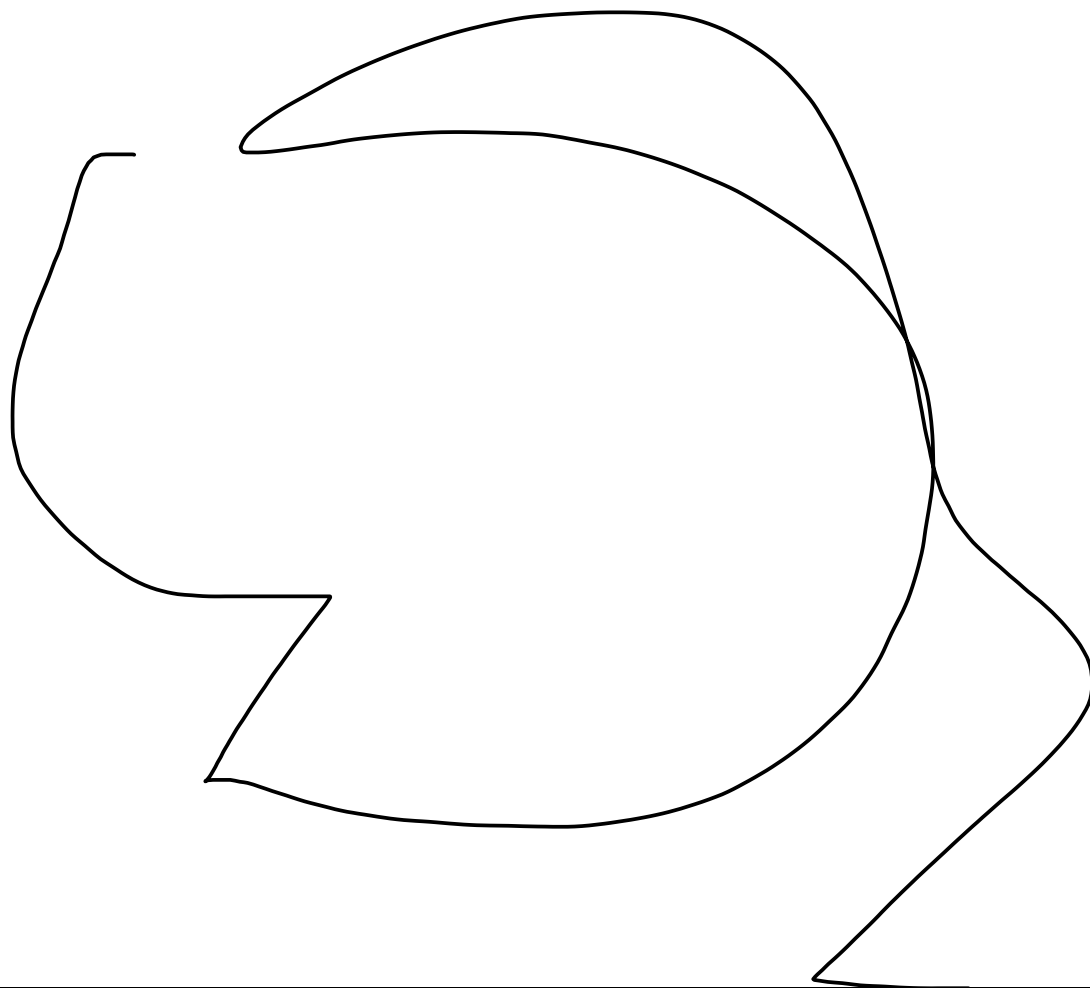
- Introduction to site layout
- Scales
- Graphics and design
- Site mapping and layout
- Site planning and analysis
- Introduction to urban design
- Urban design consideration
- CAD
- Modelling

## **ASSIGNMENT 1: NEIGHBOURHOOD MAP**

Students are asked to produce a freehand map of the area which they live. These may include housing areas, shops, community building, leisure etc. The map should indicate principal streets, roads, rivers, buildings and infrastructures. A short verbal description should also be included in the map.

Final presentation shall be on A2 sized cartridge paper, well labelled and titled.

练习1课时



Residential building



Market



Trees/shrubs

Name:

Number:

Date:

Module:

Scale:

## **What is a plan?**

理论：2课时

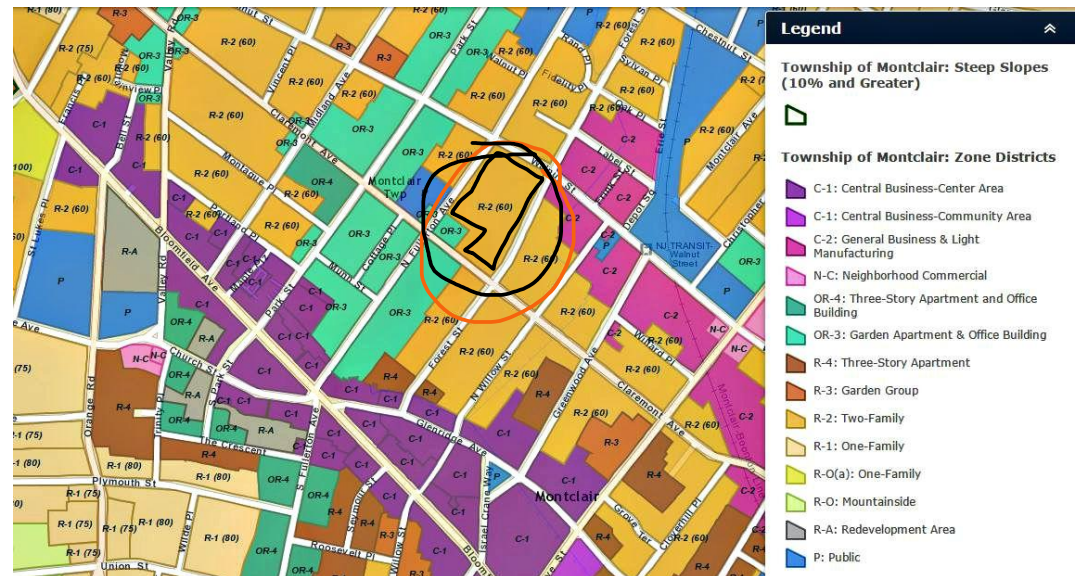
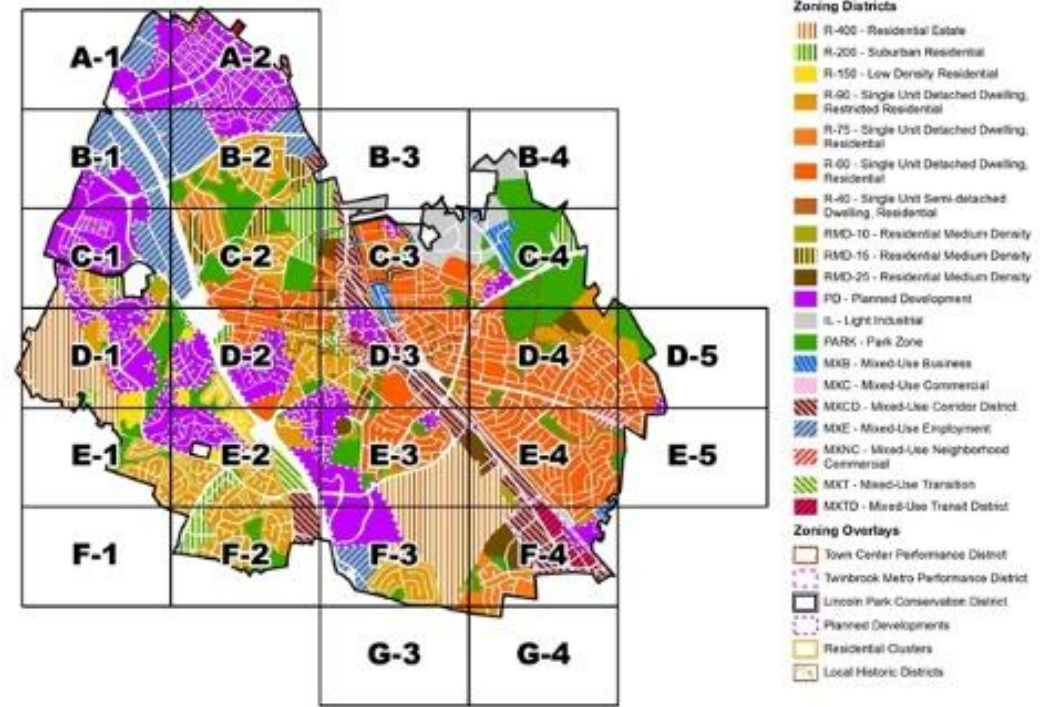
a visual representation of a place or building scaled and viewed from above.

## **Types of plan**

- ☐ Zoning plan
- ☐ Site plan
- ☐ Transportation plan
- ☐ Master plan
- ☐ Layout plan

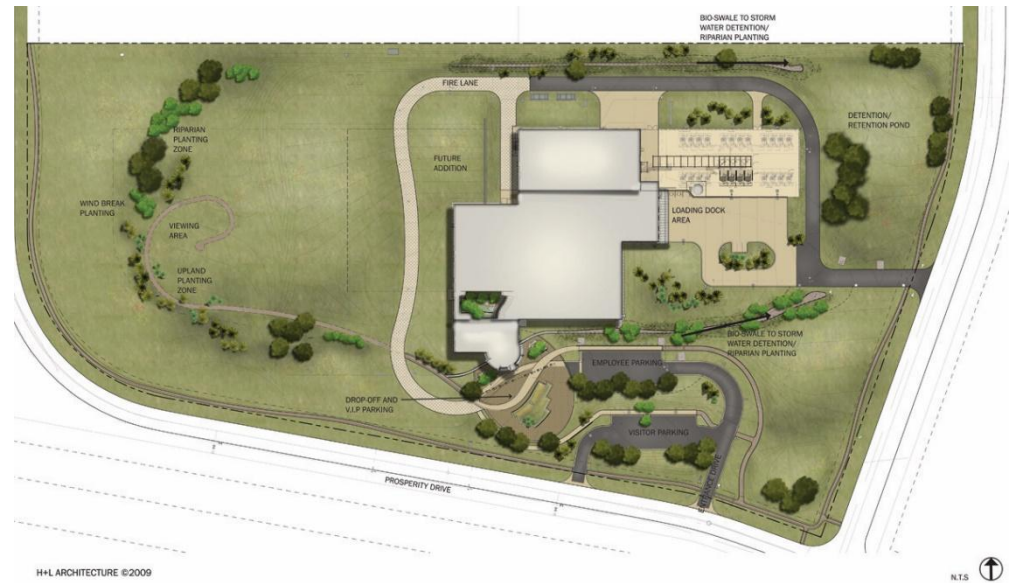
# □ Zoning plan

**Zoning** is the process of dividing land in an area into zones (e.g. commercial, residential) in which certain land uses are permitted or prohibited.



## ❑ Site plan

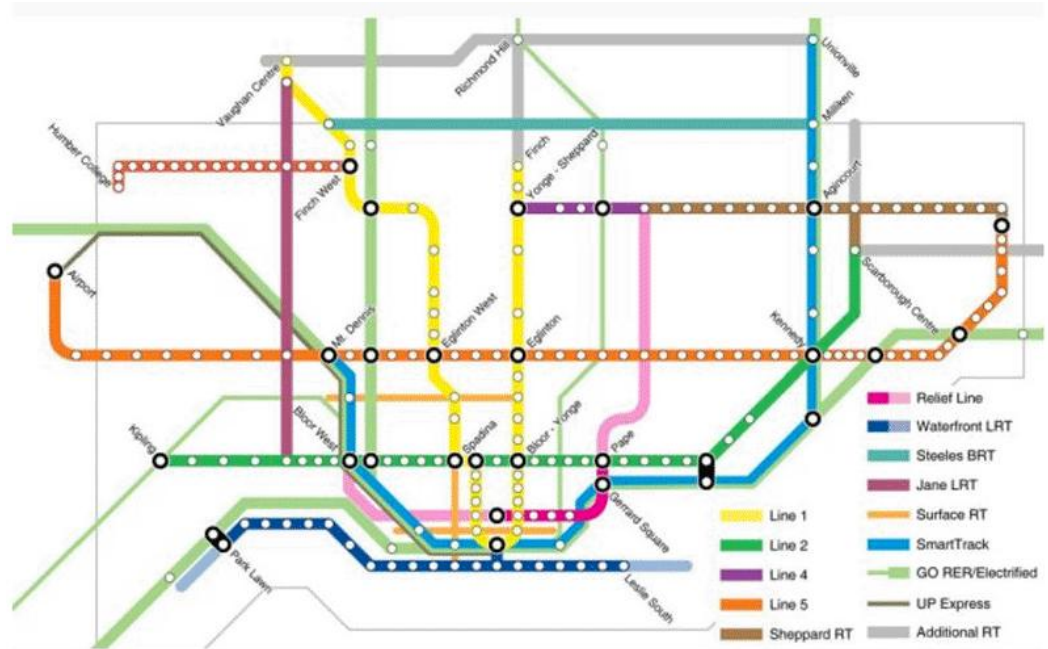
A **site plan** is an architectural plan, landscape document, and a detailed engineering drawing of proposed improvements to a given site. A site plan usually shows a building footprint, travelways, parking, drainage facilities, sanitary sewer lines, water lines, trails, lighting, and landscaping and garden elements.





## ❑ Transportation plan

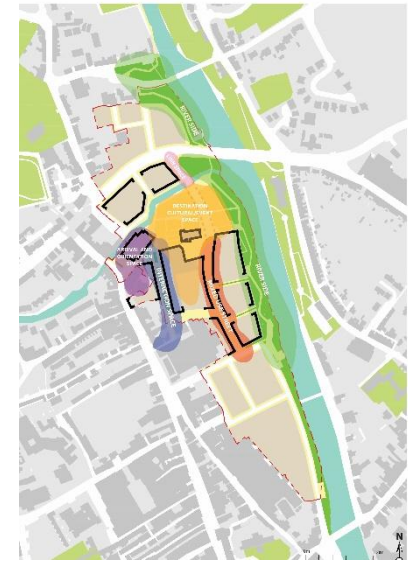
**Transportation Plan** is a movement and access plan that shows transportation, movement and access routes e.g bridges, rail centres, access roads etc.





## ❑ Master plan

A **master plan** is a dynamic long-term planning document that provides a conceptual layout to guide future growth and development. A **master plan** includes analysis, proposals and recommendations for a site's population, economy, housing, transportation, community facilities, and land use.



## What is site layout? 课堂训练1课时

The act or an instance of laying out. An arrangement or plan, especially the schematic arrangement of parts or areas: the **layout** of a factory; the **layout** of a printed circuit.

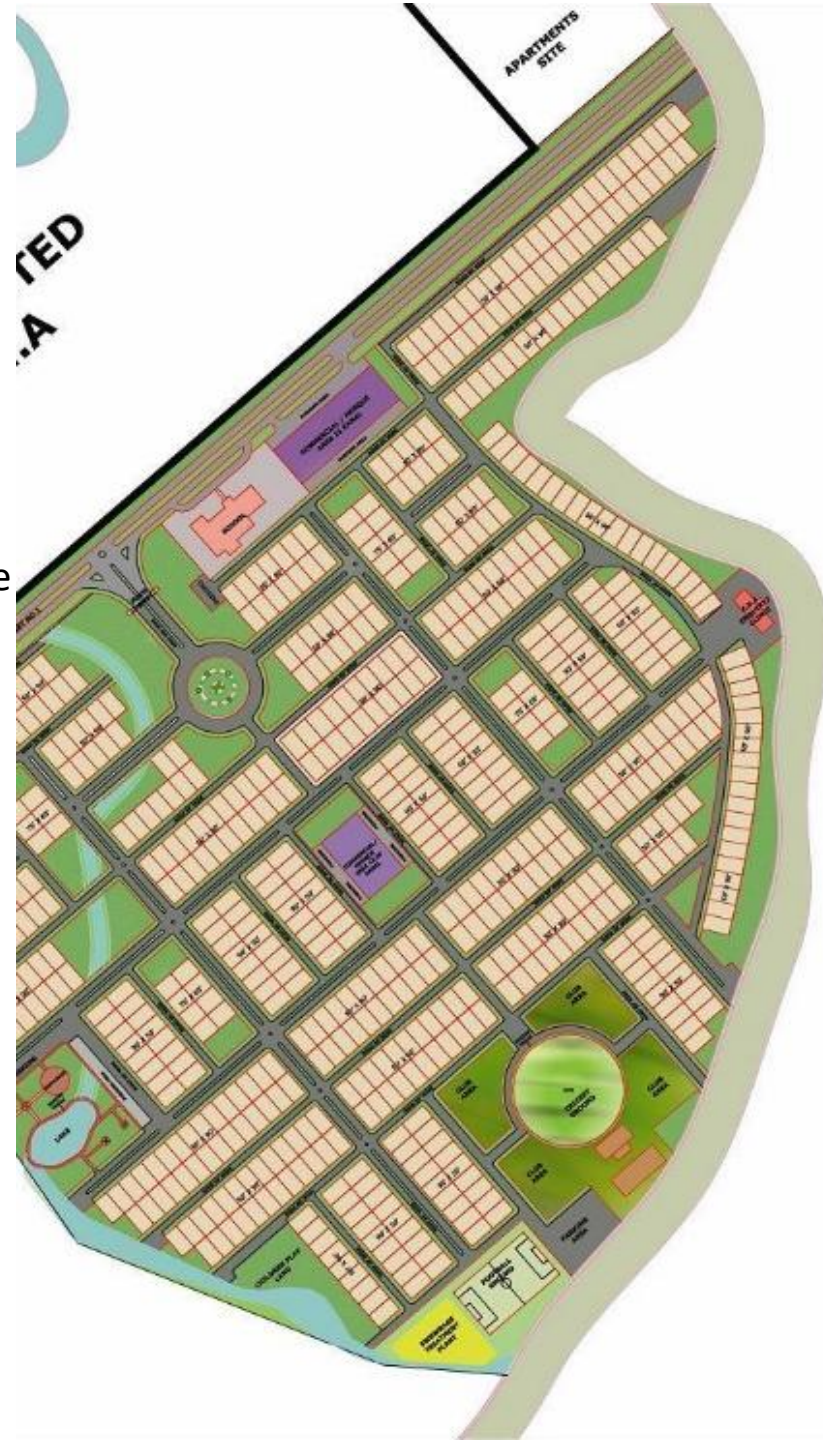
Drawing which specifies the scope and disposition of site land, site limits, buildings, roads, type of coverings of ground, vegetation, levels, etc. (Larapedia, 2017)





## ➤ Site Layout Considerations

- ☐ Physical influences
- ☐ Environmental influences
- ☐ Economic and financial influences
- ☐ Statutory restrictions
- ☐ Availability and proximity to utilities and infrastructure
- ☐ Cost
- ☐ Quality of site (land)
- ☐ Landuse
- ☐ Location
- ☐ Access
- ☐ Topography
- ☐ Orientation



# Benefits of Good Site Layout Planning

Site layout shows the relationship of the proposed site with its surroundings with respect to communication, approaches, and existing facilities.

Good site layout planning assists in:

- ☐ Functional urban structure
- ☐ Good urban form
- ☐ Functional urban realm
- ☐ Efficient urban block
- ☐ Accessibility and permeability
- ☐ Good green infrastructure



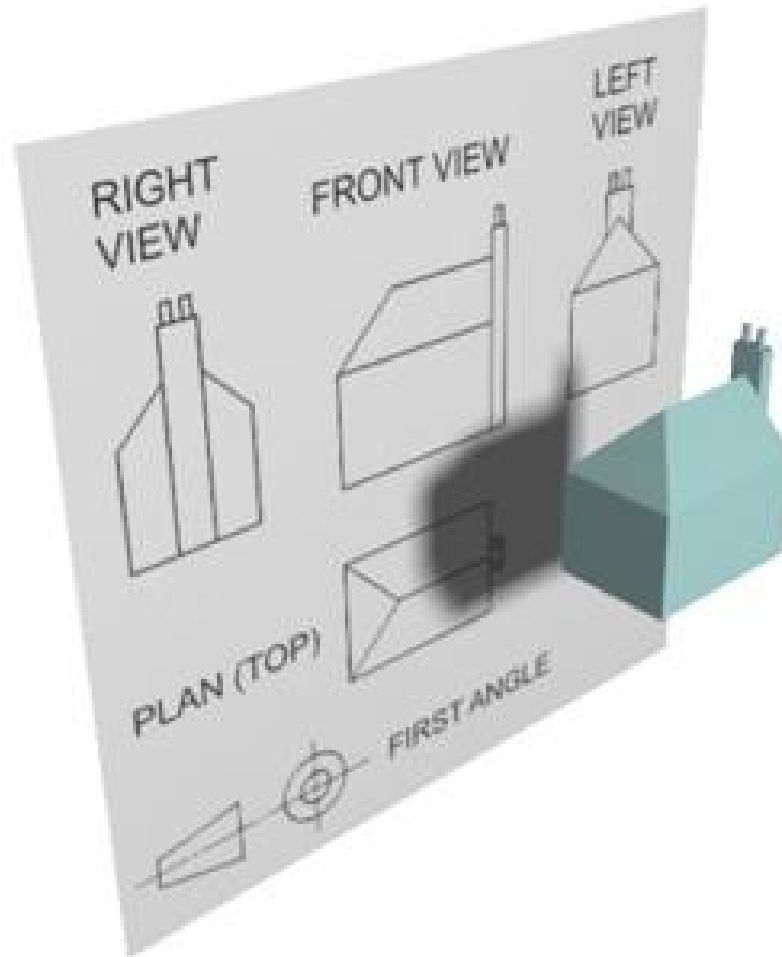
# Earth-science

## —Residential Planning

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# Orthographic projections



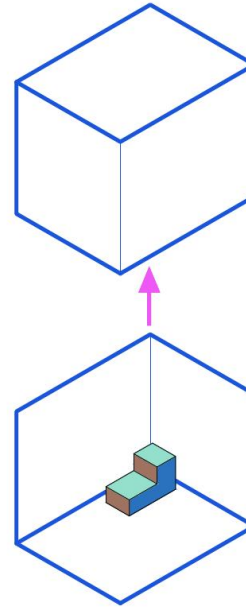
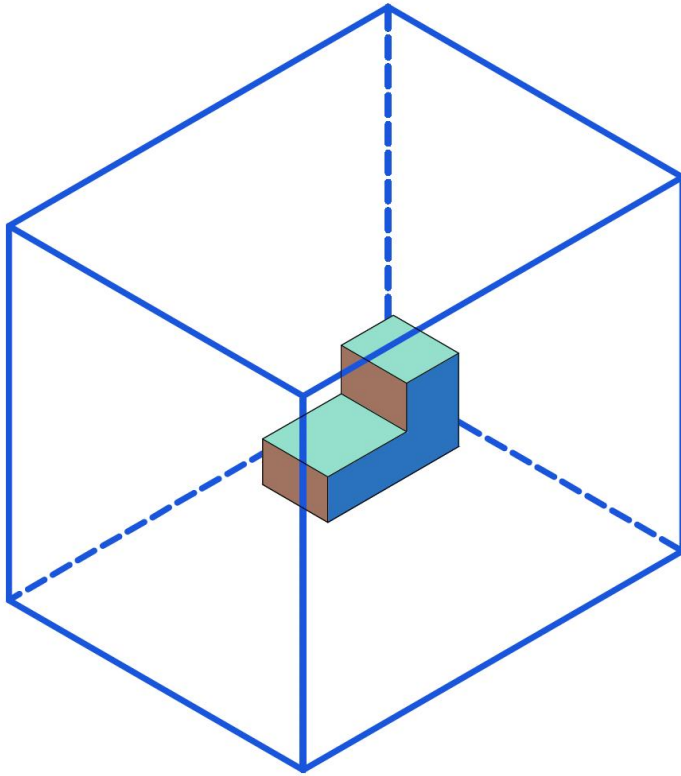
理论讲解：  
2课时



- Orthographic projection is a means of representing a solid 3D object on a 2D drawing sheet.
- This means that an object may be represented by a number of inter-related views/drawings, including: elevation, end elevation(s) and plan.
- Orthographic projection is based on :
  - a) Two principal planes - Horizontal Plane(HP) & Vertical Plane(VP), which are at  $90^\circ$  to each other.
  - b) Auxiliary Vertical Planes (AVP), at  $90^\circ$  to the HP and VP.

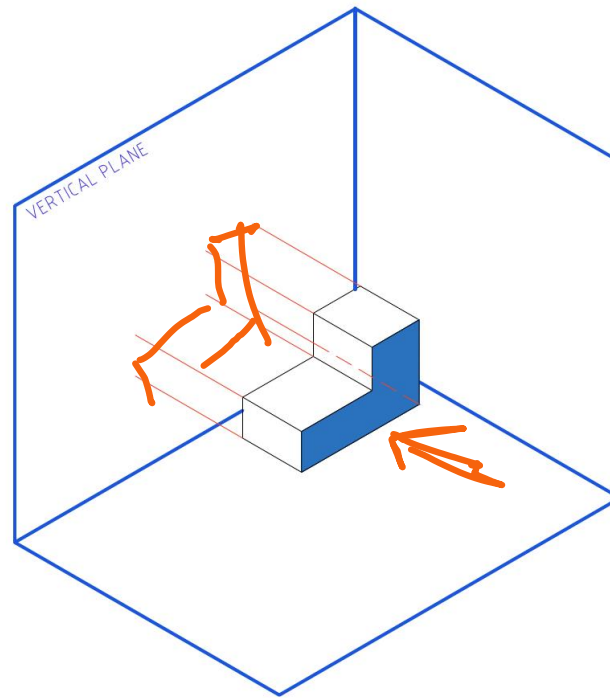
## Glass Box Metaphor.

This provides a means of understanding the process. Imagine that the object is suspended within a glass box.

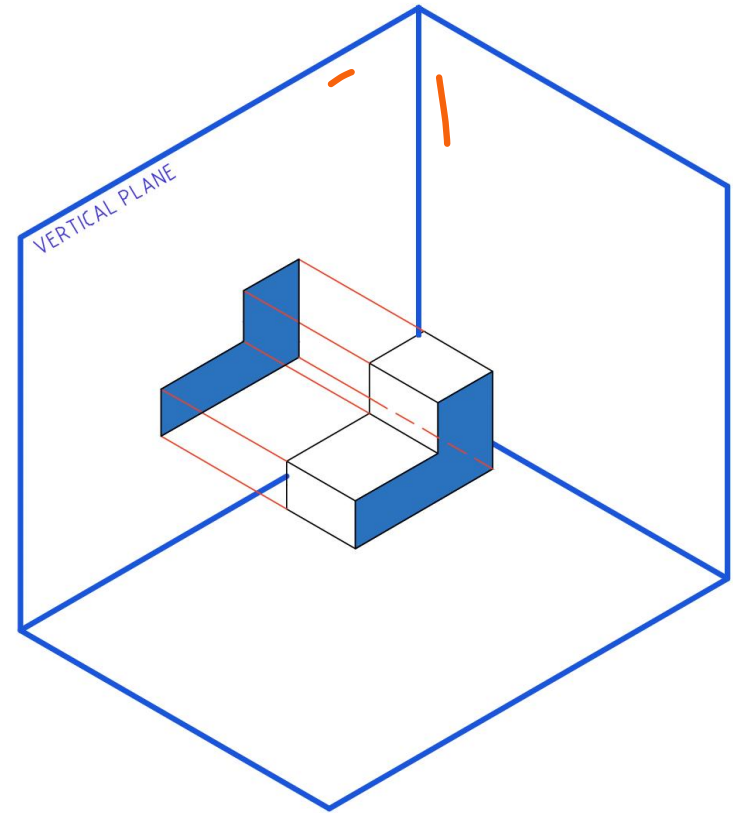
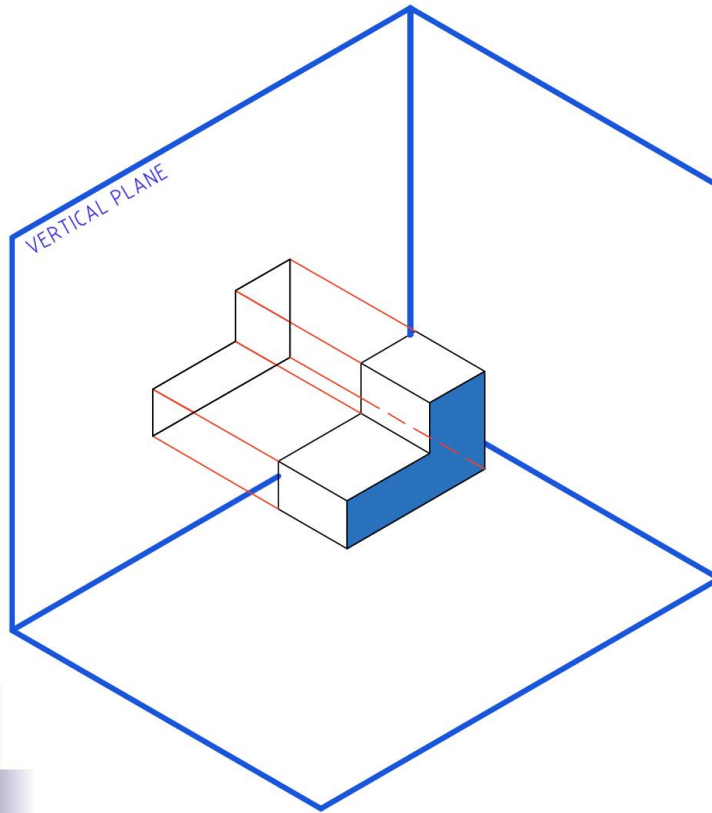


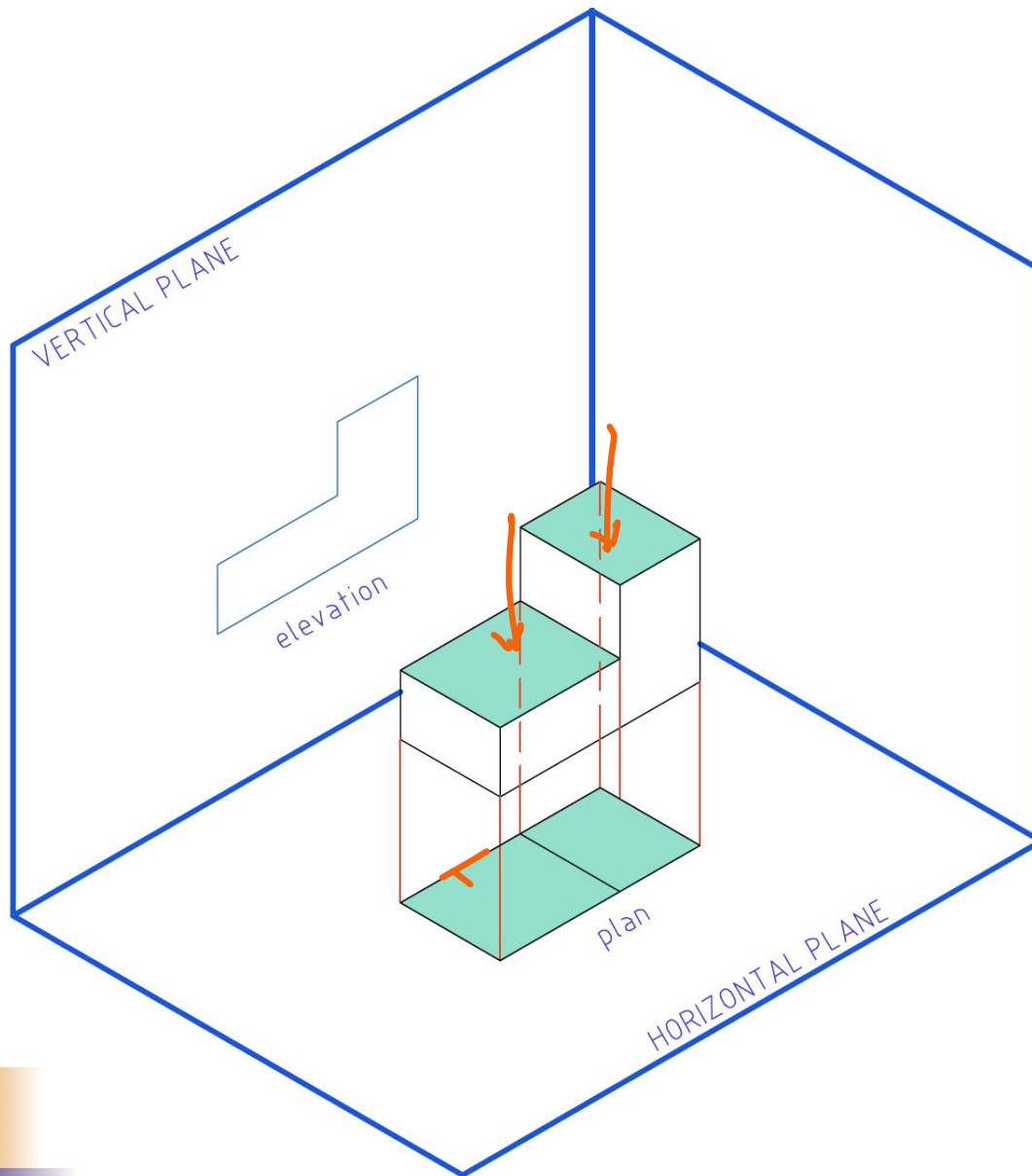
Top, front and left-hand side  
Removed for clarity

Each face of the object to be drawn is projected across to the corresponding far side of the box. The lines used to project the image of the object onto the surfaces of the glass box are  $90^\circ$  to the respective surface of the glass box.

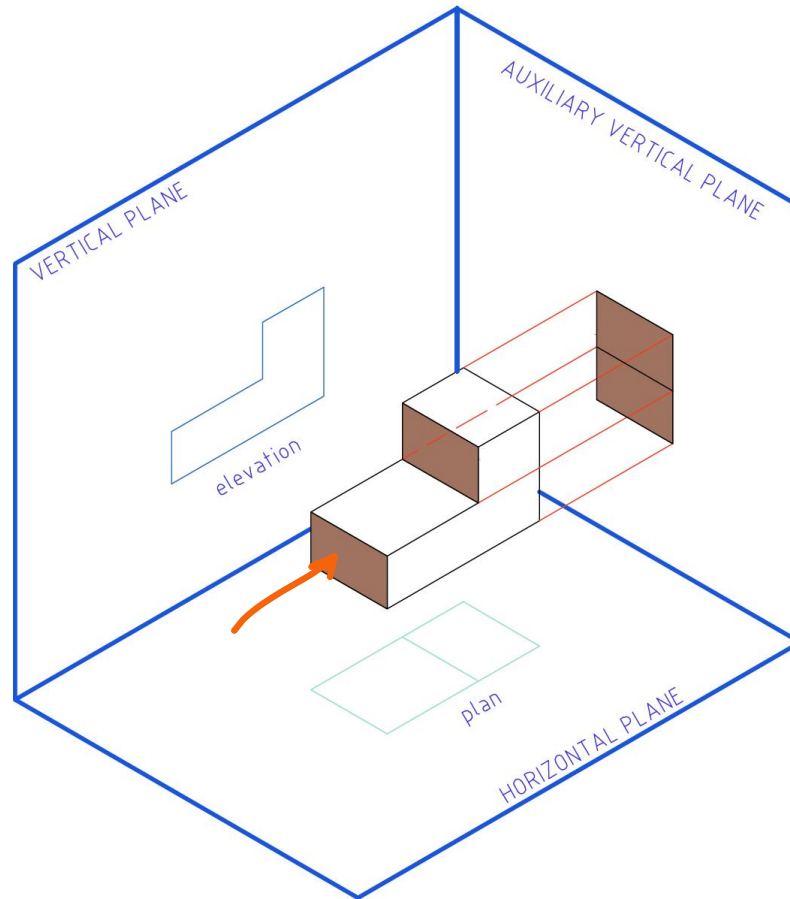


The corners of the frontal surfaces of the object are projected onto the rear of the box (VP). The points of intersection between the vertical plane and the projection lines are connected to form the elevation.



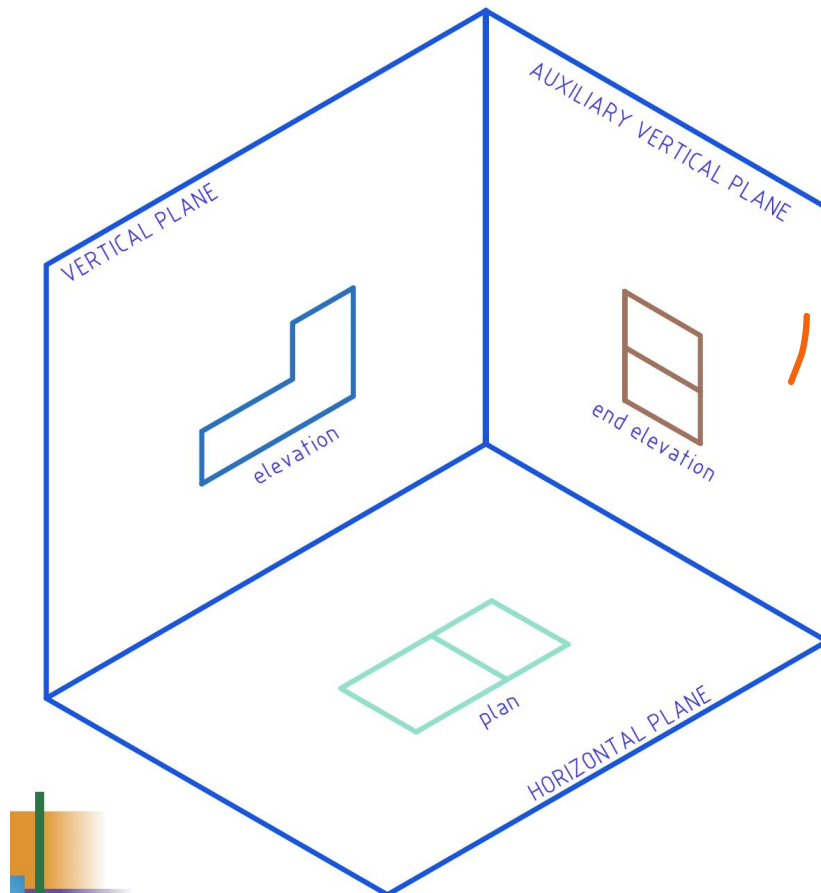


The surfaces of the object which are visible from the top are projected onto the base of the box (HP). Thus forming the plan.



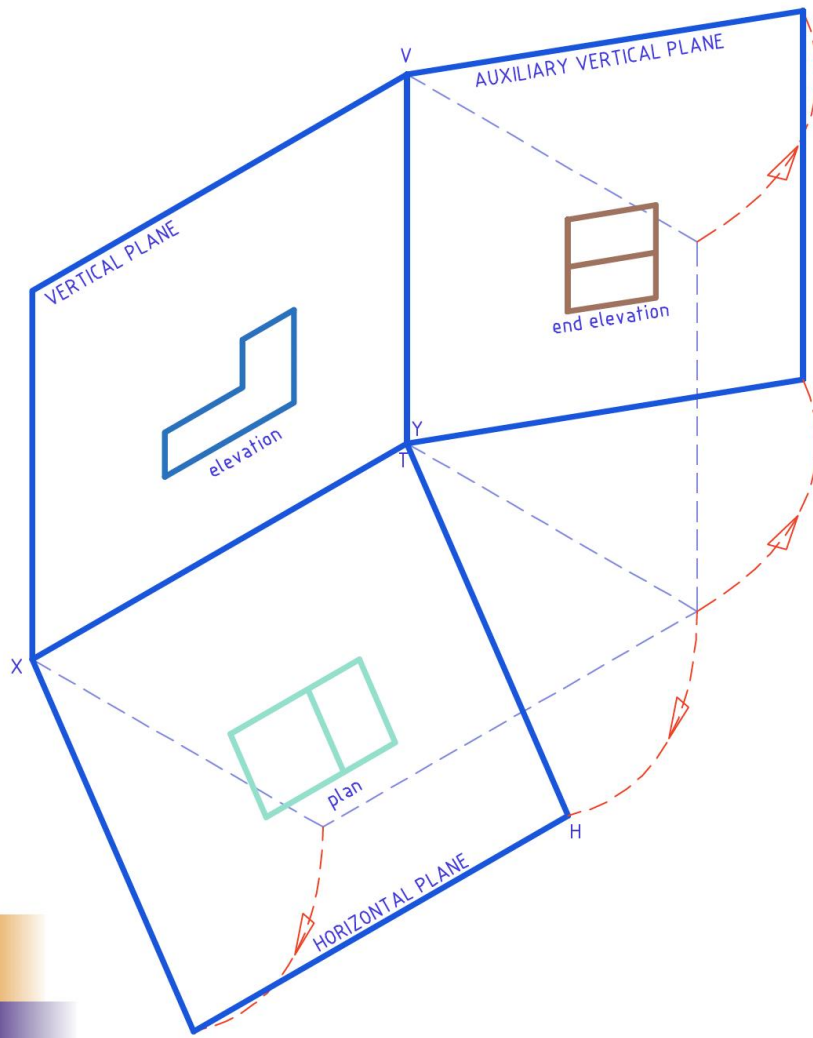
The surfaces of the object which are visible when viewed from the side(s) are projected onto the side(s) of the box (AVP). Thus forming the end elevation(s).





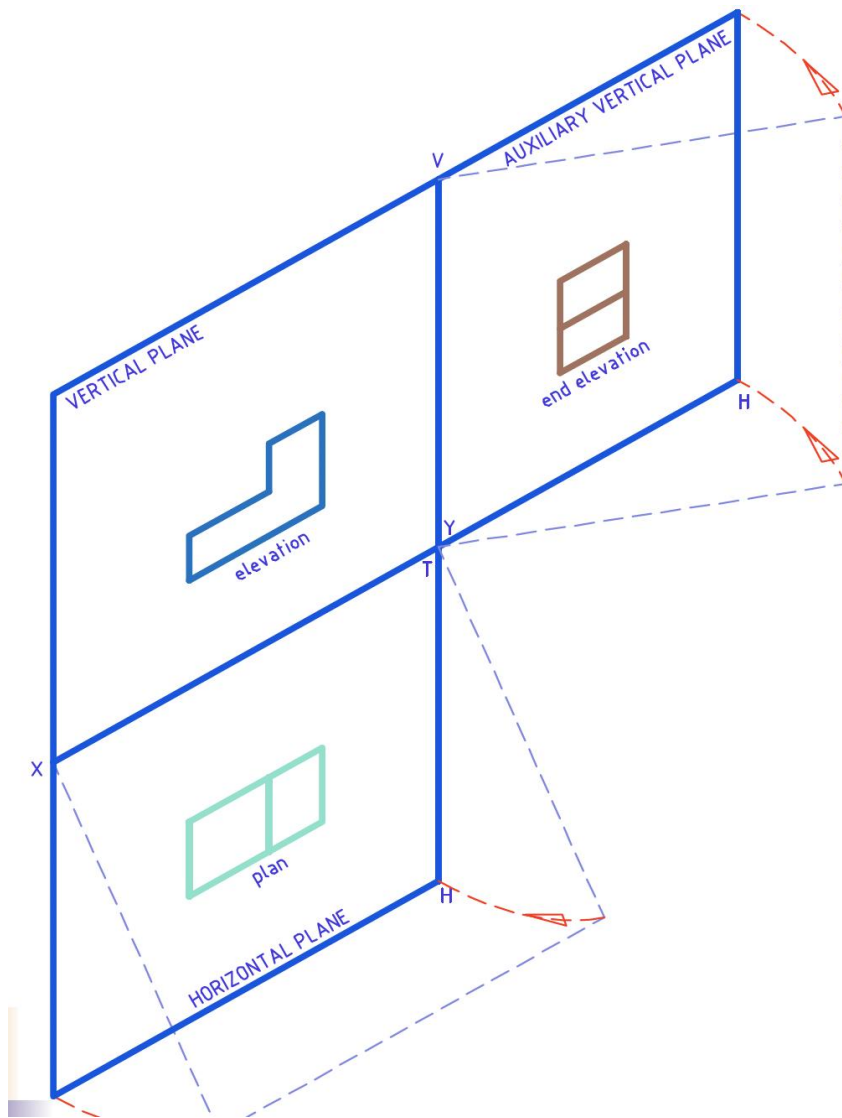
- The elevation is projected onto the Vertical Plane.
- The plan is projected onto the Horizontal Plane.
- The end elevation(s) are projected onto the Auxiliary Vertical Plane(s).

立面翻转绘图练习：用时**1**节课

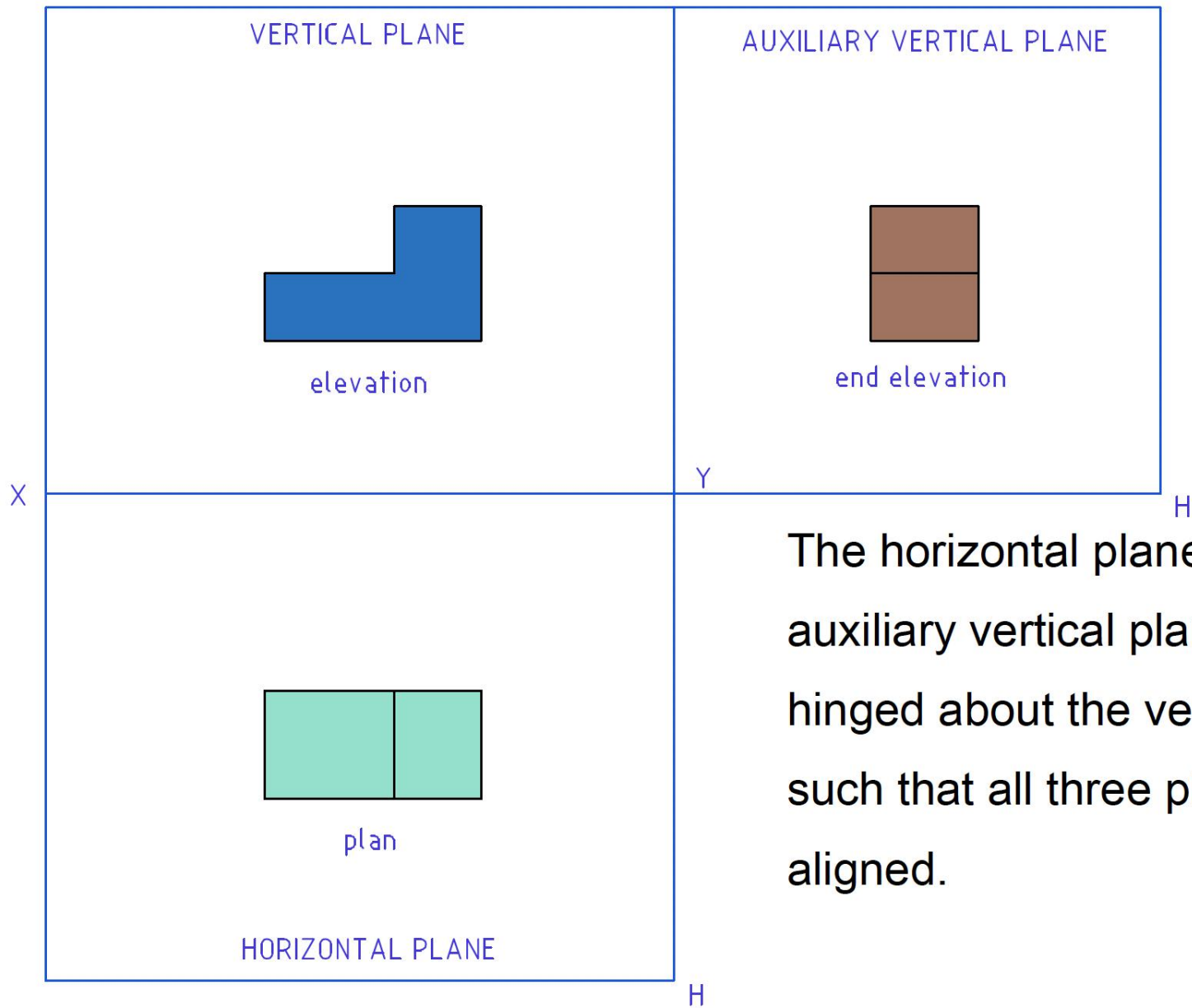


The sides of the glass box are now folded out.

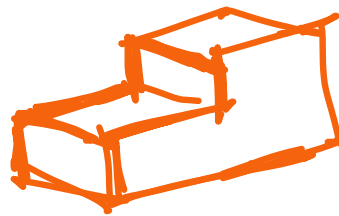
The horizontal plane and the auxiliary vertical plane are hinged about the vertical plane.



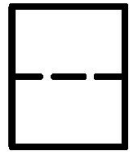
The horizontal plane and the auxiliary vertical plane are hinged about the vertical plane such that all three planes become aligned.



The horizontal plane and the auxiliary vertical plane are hinged about the vertical plane such that all three planes are aligned.

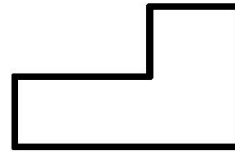


AUXILIARY VERTICAL PLANE



end elevation

VERTICAL PLANE



elevation

AUXILIARY VERTICAL PLANE



end elevation

X

Y

H



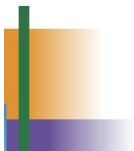
plan

HORIZONTAL PLANE

H1

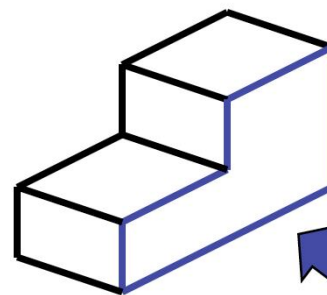
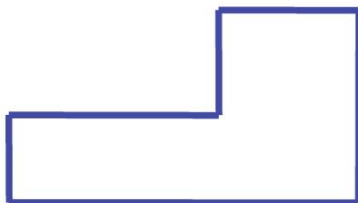
H

A second end elevation may be projected onto the opposite auxiliary vertical plane.



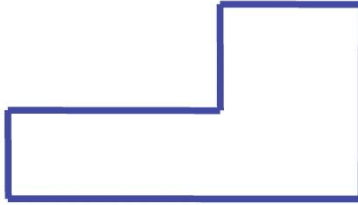


**Elevation**



**Elevation**

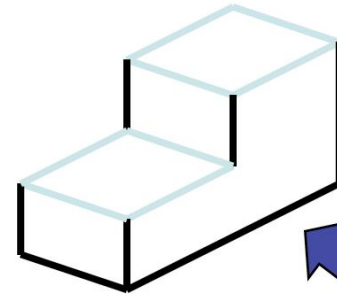
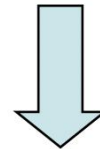
Elevation



Plan



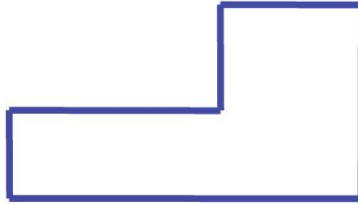
Plan



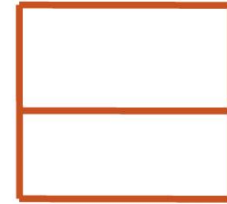
Elevation



**Elevation**



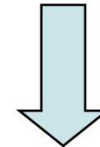
**End View 1**



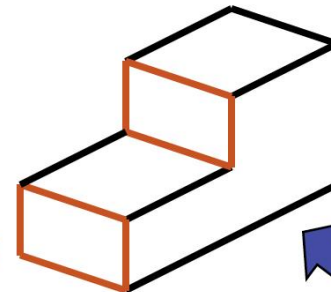
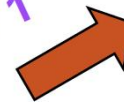
**Plan**



**Plan**



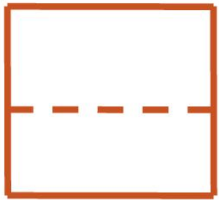
**End View 1**



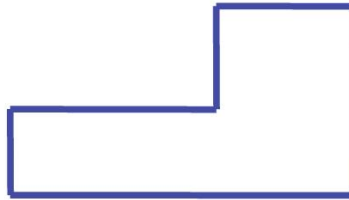
**Elevation**



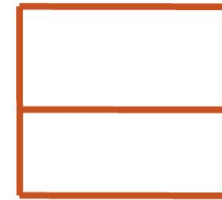
**End View 2**



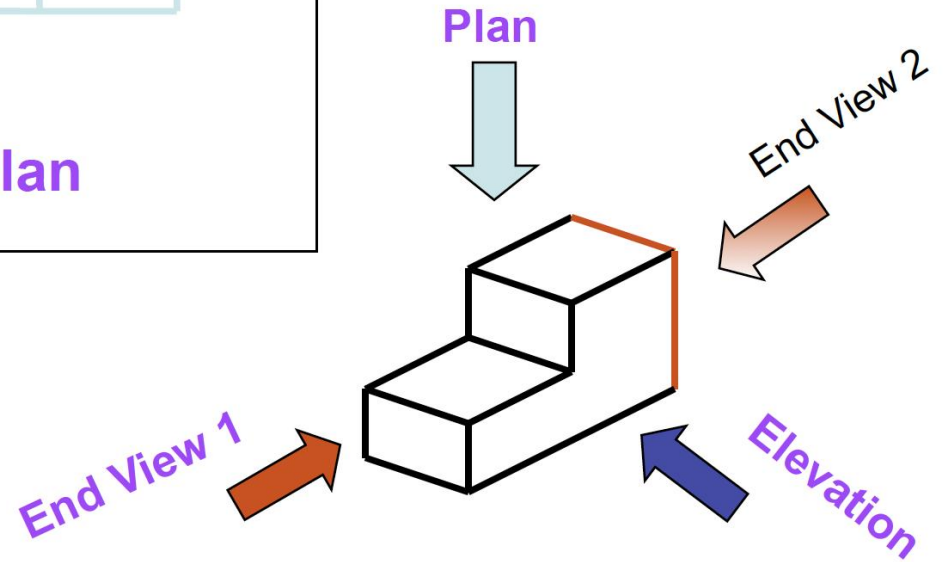
**Elevation**



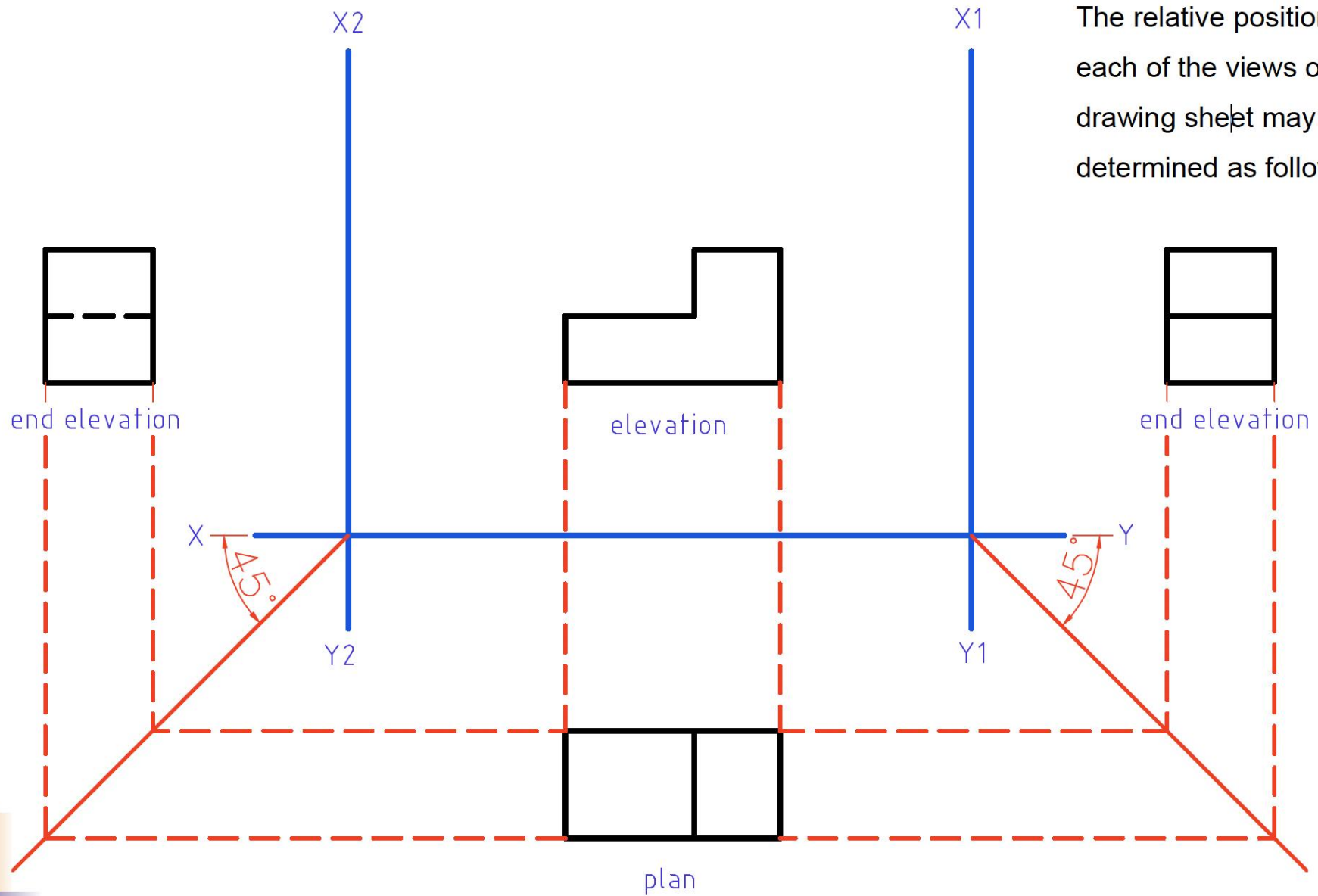
**End View 1**



**Plan**



## 透视图纸绘制讲解理论2 课时

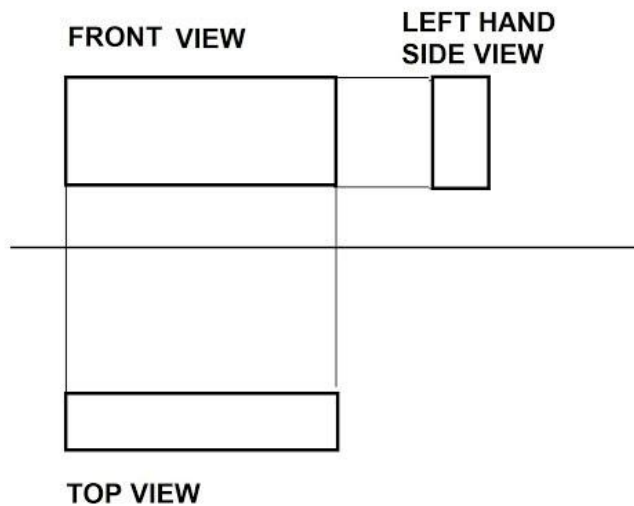


The relative positions of each of the views on the drawing sheet may be determined as follows:

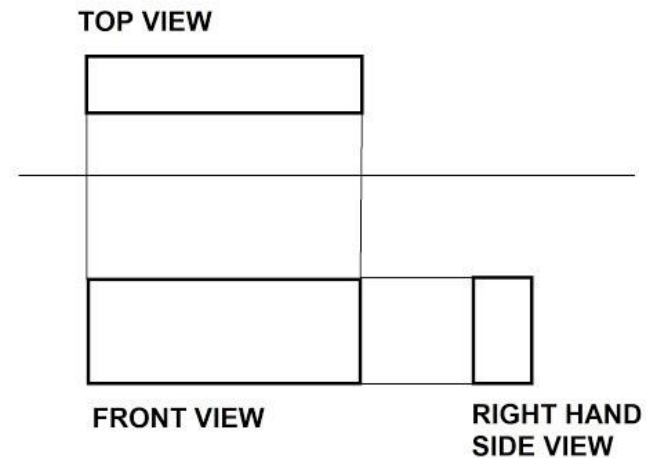


# Orthographic Projection Systems

**1st Angle**



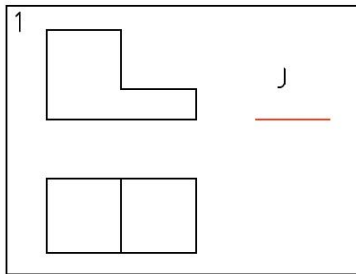
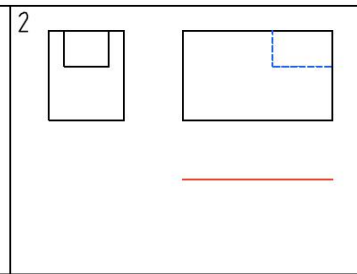
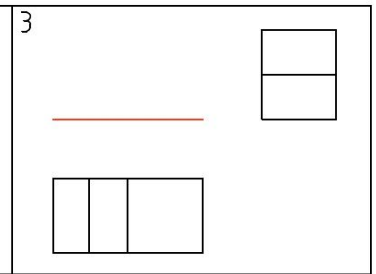
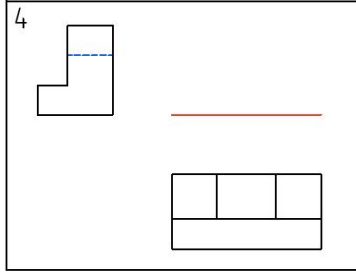
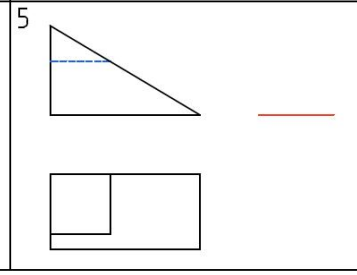
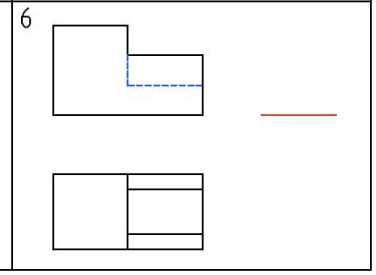
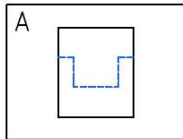
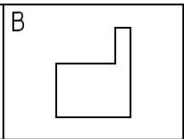
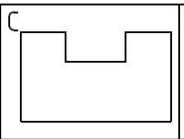
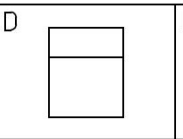
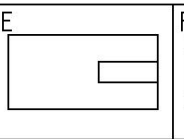
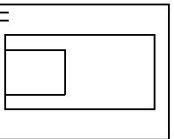
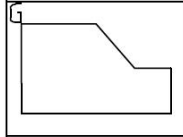
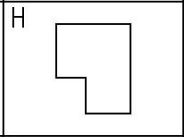
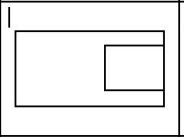
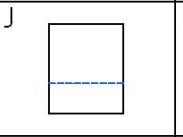
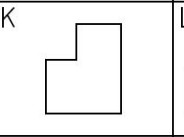
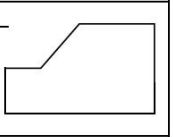
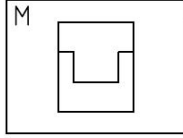
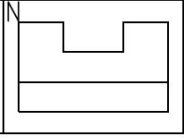
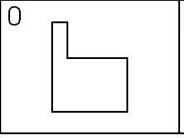
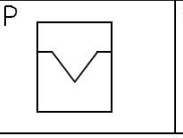
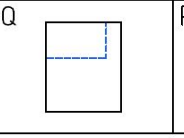
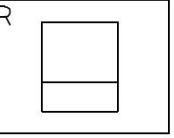
**3rd Angle**



# ACTIVITY 1.

Select, from the views A to R across, the missing view from each of the drawings from 1 to 6. Insert the appropriate letter in the space provided.

Example: the view J is missing from drawing 1.

1 	2 	3 			
4 	5 	6 			
A 	B 	C 	D 	E 	F 
G 	H 	I 	J 	K 	L 
M 	N 	O 	P 	Q 	R 

## ACTIVITY 1 (cntd.)

Select, from the views A to R across, the missing view from each of the drawings from 7 to 12. Insert the appropriate letter in the space provided.

<p>7</p> <p>_____</p>	<p>8</p> <p>_____</p>	<p>9</p> <p>_____</p>
<p>10</p> <p>_____</p>	<p>11</p> <p>_____</p>	<p>12</p> <p>_____</p>

A 	B 	C 	D 	E 	F 
G 	H 	I 	J 	K 	L 
M 	N 	O 	P 	Q 	R 

## **ASSIGNMENT 2: SCALED DRAWING**

Students are asked to produce scaled drawings of a building or house which they have access:

1. Front elevation of building and cross section
2. Floor plan

Drawings should be drawn in AutoCAD to scale 1:25 or 1:50.

软件练习Project hand-out : 3 课时

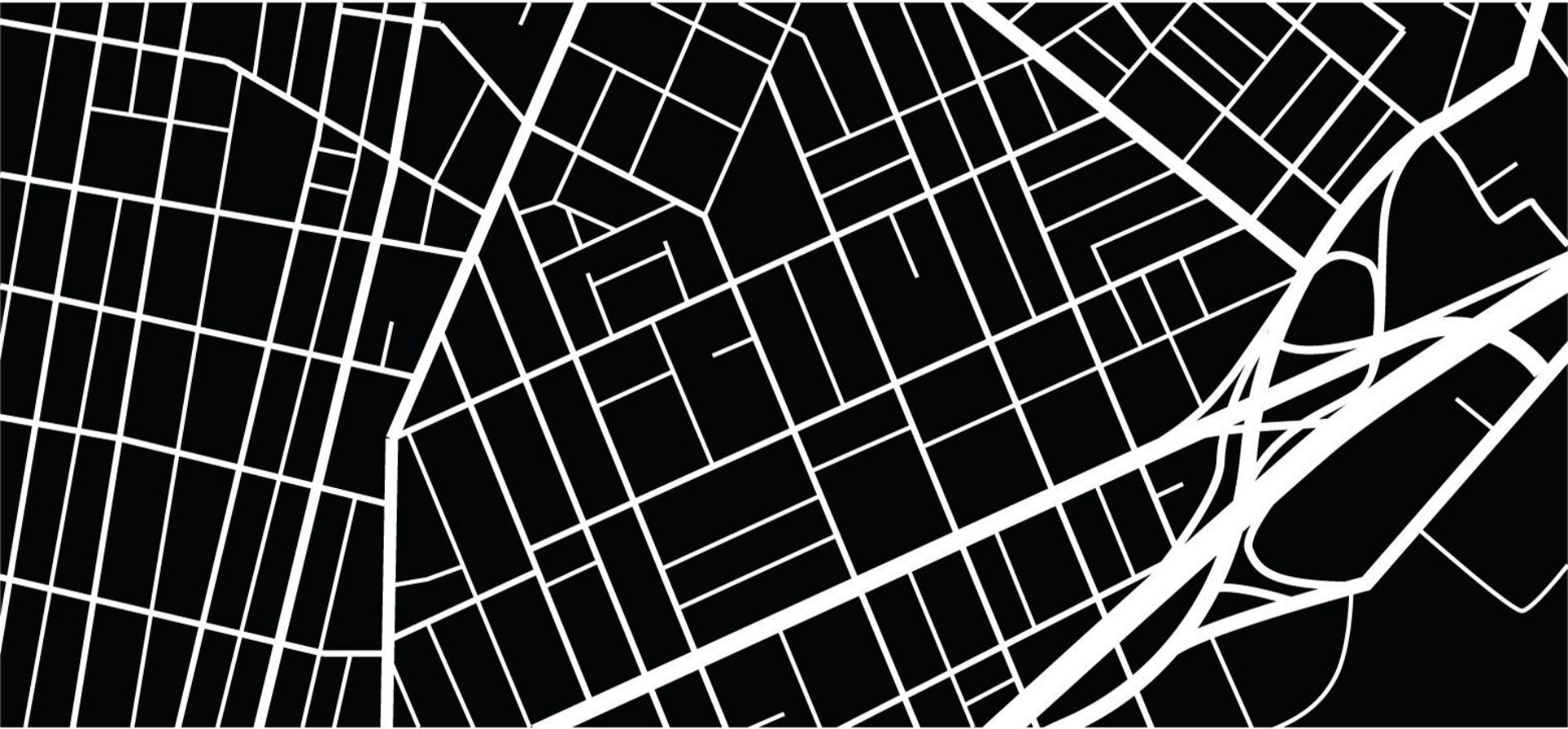
Earth-science

—Residential Planning

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## STREETS AND URBAN BLOCKS





## **Urban blocks and urban block typologies**理论部分2课时

Urban blocks are the basic building blocks of urban areas. They provide the developable land in a range of shapes, sizes and formats.

There are basic typologies of urban block:

- Traditional or perimeter block - buildings surrounding the edges of the block;
- Pavilion blocks - buildings sitting within urban blocks; and
- Solid blocks - a single building taking up an entire block.

There are also hybrid blocks:

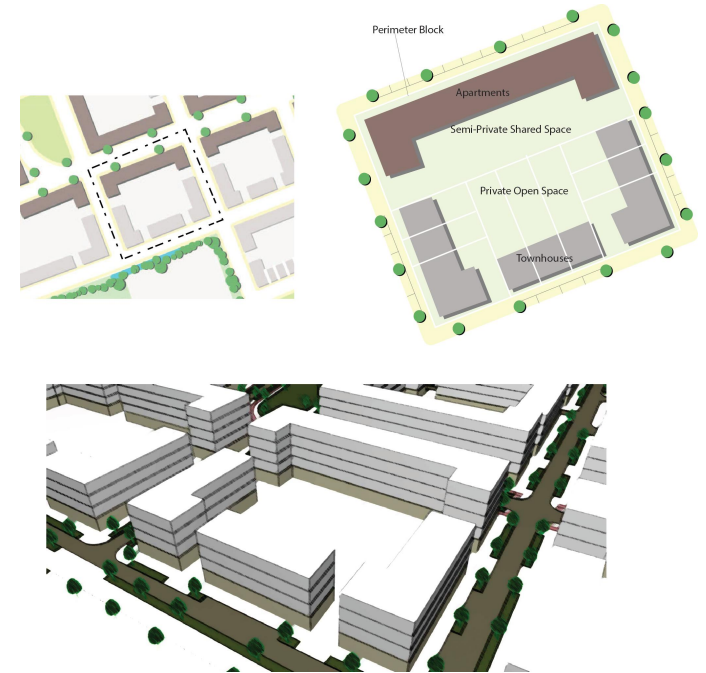
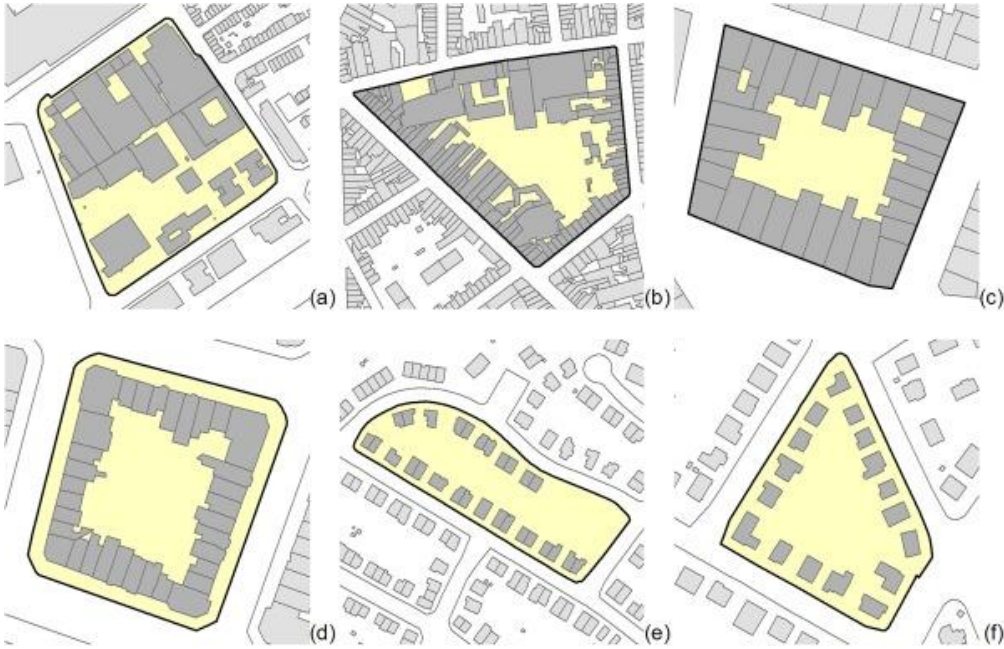
- Perimeter/pavilion – parceled block, generally half of block comprises pavilion.
- Pavilions - multiple stand-alone buildings without block subdivision.
- Solid/perimeter hybrid – Ground floor solid (commercial use) and upper floor perimeter (over the ground floor and on a slab).

# URBAN BLOCKS

An urban block is the smallest area that is surrounded by streets.



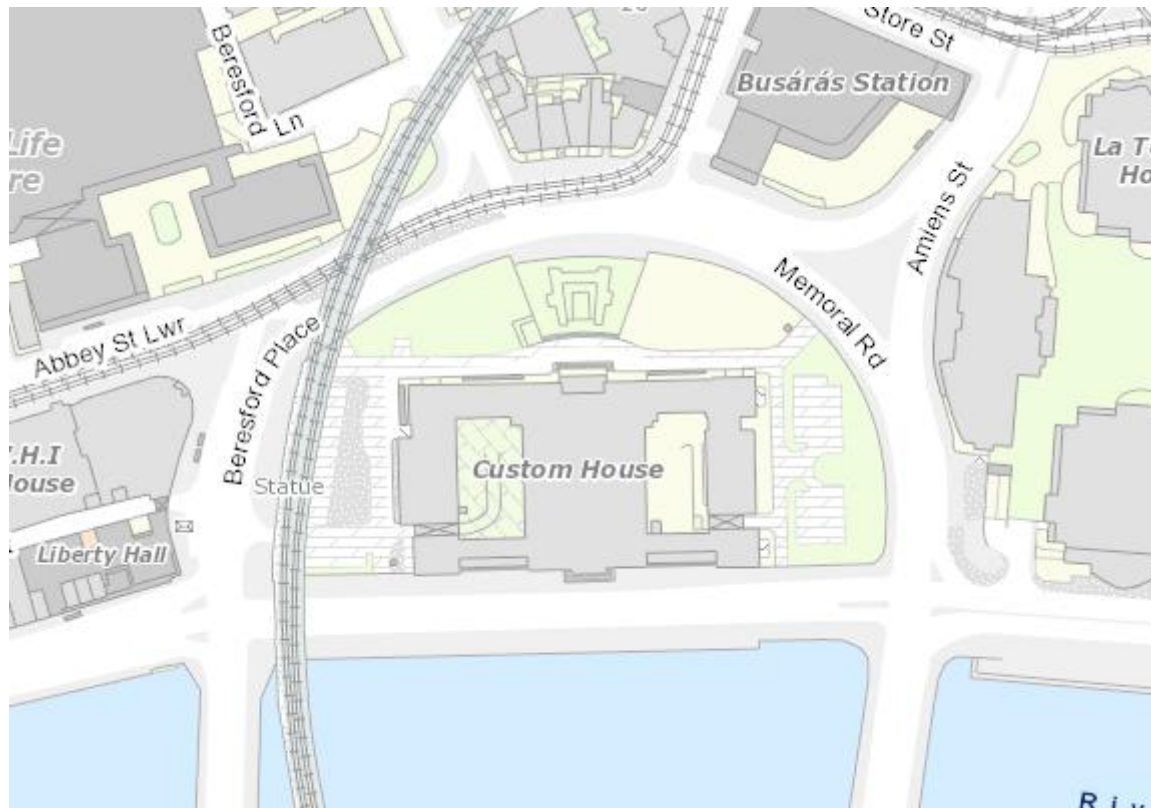
# Urban Block



## Pavilion blocks

This is a pavilion block comprising a single building sitting within the block.

Notably, the block is not subdivided into plots, either functionally or in terms of ownership.





## Solids or solid blocks

This is a solid block comprising a single building. It covers all of or most of the area of the block, leaving now surrounding areas.

Again, this block is not subdivided into plots, either functionally or in terms of ownership.



# Rules for making fine grain urban blocks

Kilkenny Abbey  
Creative Quarter, 2018

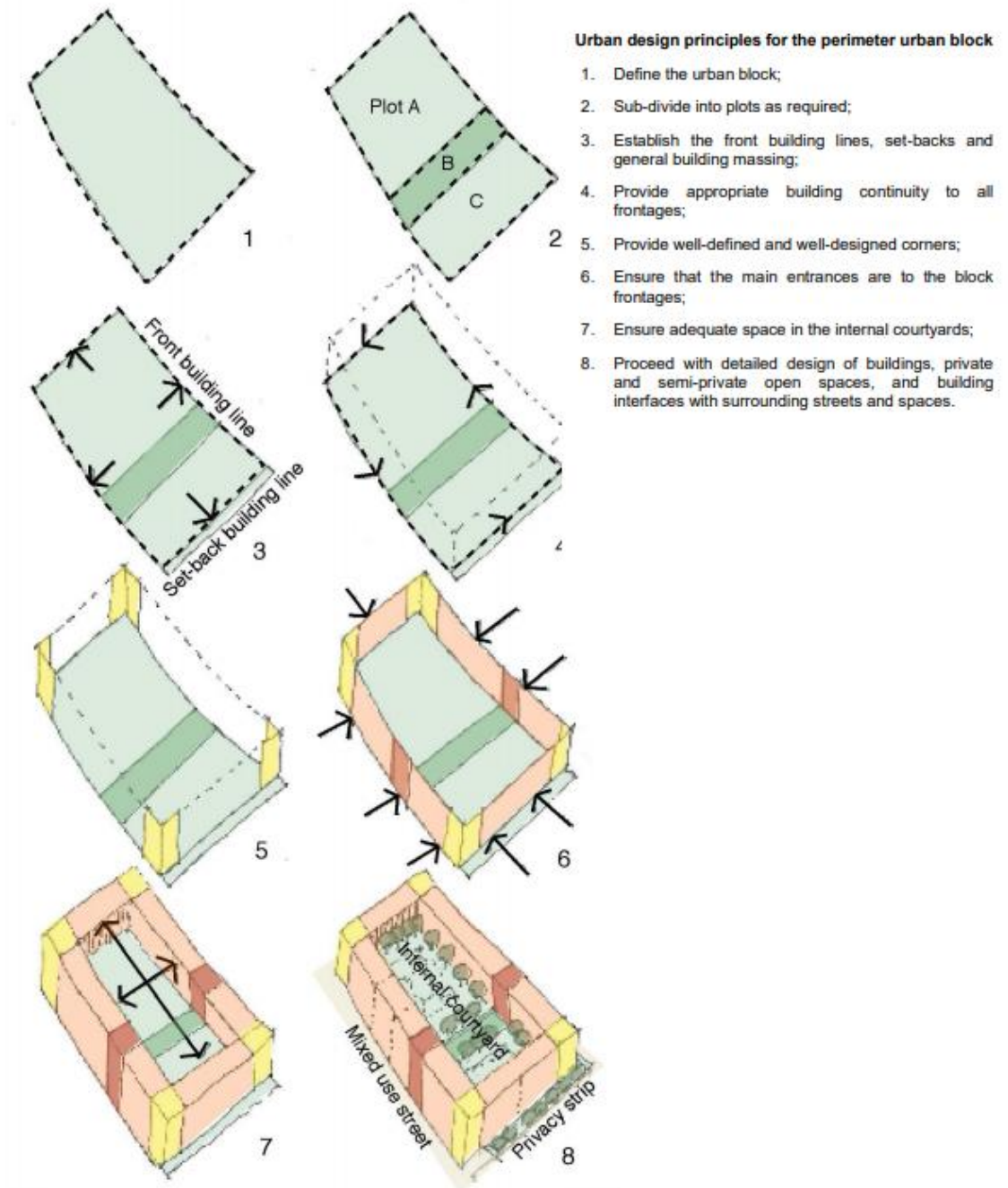
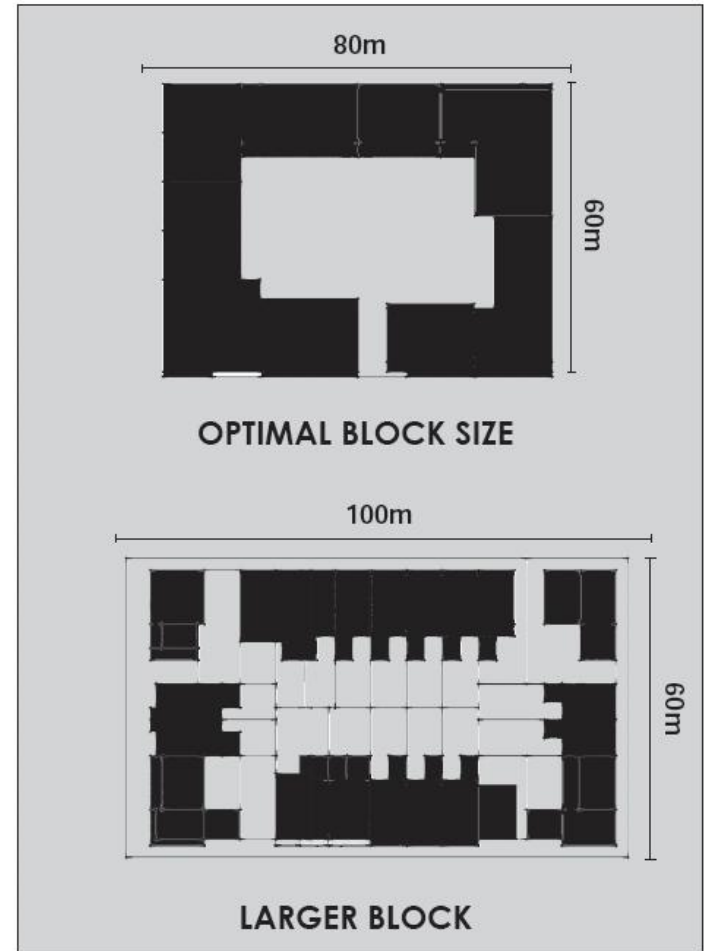


Figure 14: Urban design principles for urban blocks



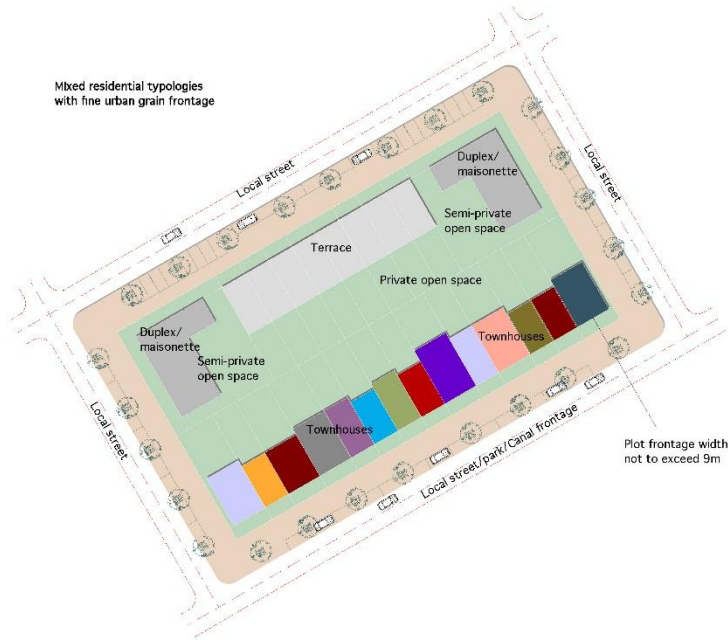
# Size of Blocks

- Designers must also have regard to size of blocks within a street network and how they impact on permeability.
- Smaller, more compact blocks should be focused around *Centres* to optimise connectivity.
- Larger block sizes may occur away from *Centres*, through less intensively developed areas.
- A block dimension of 60-80m is optimal for pedestrian movement and will sustain a variety of building types.
- This range of dimensions should be considered for use within intensively developed areas, such as *Centres*, to maximise accessibility.
- Larger blocks within *Centres* and *Business Parks/Industrial Estates* may be required to cater for larger commercial or civic developments. In such cases mid-block pedestrian links should be provided.
- A block dimension of up to 100m will enable a reasonable level of permeability for pedestrians and may also be used in *Neighbourhoods* and *Suburbs*.

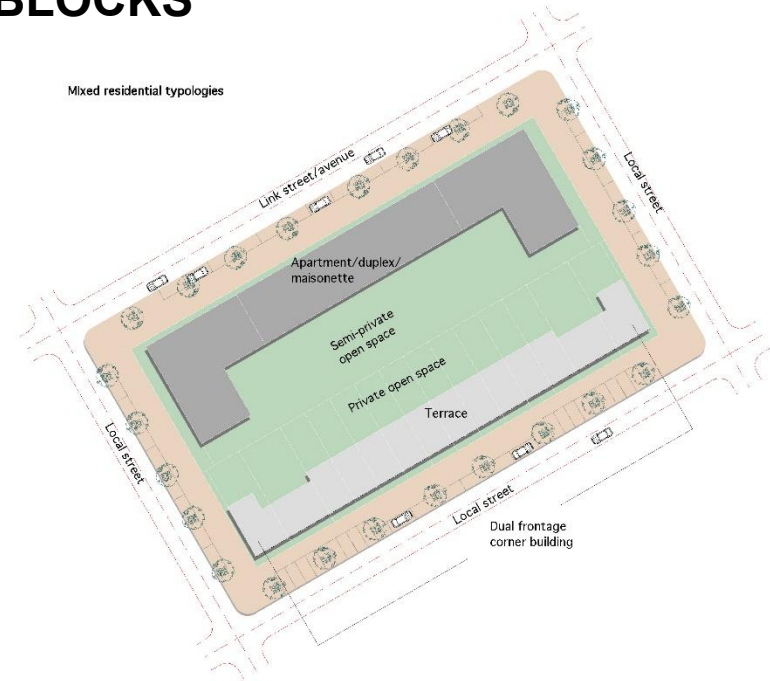


# BUILDING FRONTAGES AND URBAN BLOCKS

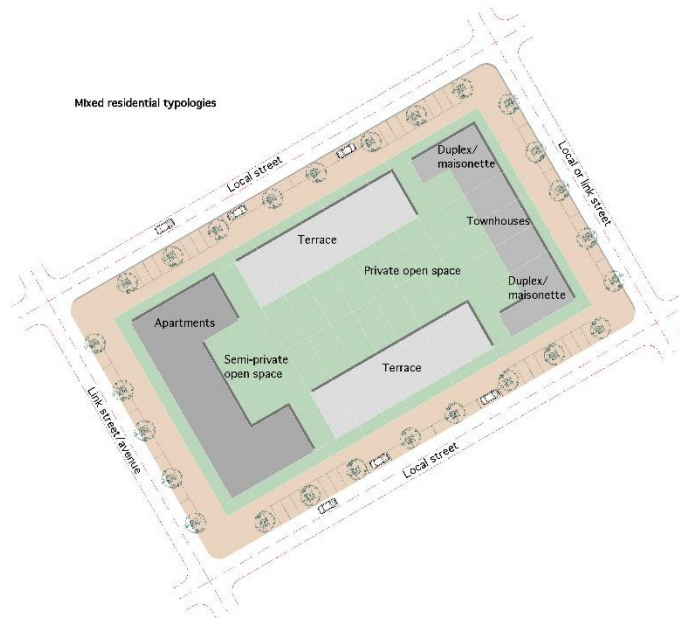
Mixed residential typologies  
with fine urban grain frontage



Mixed residential typologies



Mixed residential typologies



## **Features of good urban blocks**

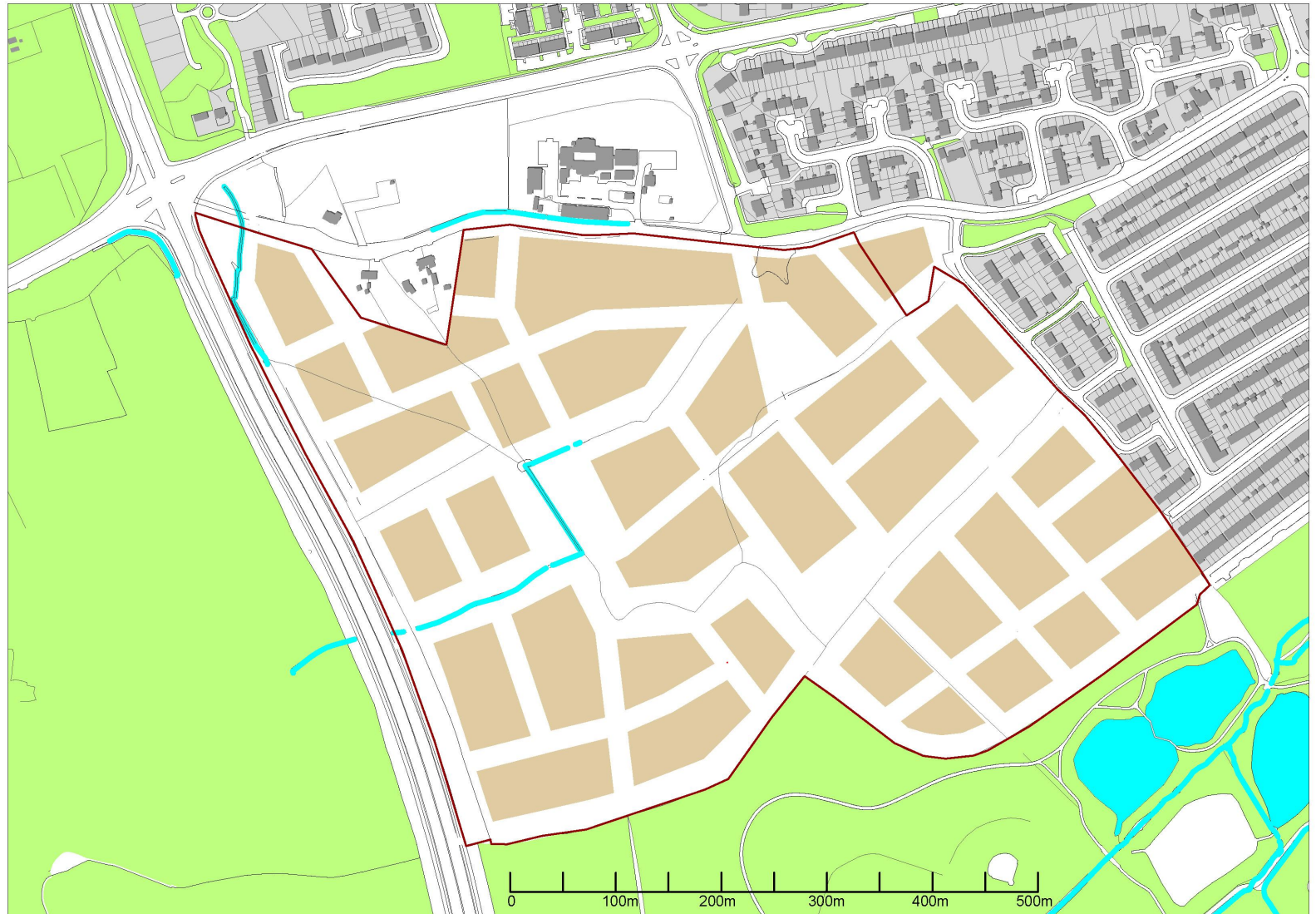
- Appropriate relationship with surrounding urban blocks – scale and typology;
- Responds to local topography and street patterns;
- Provides continuity of the street - continuous or relatively continuous frontage - often referred to as massing;
- Provides active frontage to more public streets and spaces – particularly at ground floor;
- Provides enclosure of the street - building height adequate to provide sense of enclosure;
- Makes a contribution to legibility - e.g. proper, well-considered and formed corners;
- Provides a clear distinction between public and private/semi-private areas;

## **Features of good urban blocks (contin.)**

- Ensures adequate light to building faces and open spaces;
- Ensures appropriate levels of privacy - particularly 'back to back' at private or semi-private spaces;
- Provides adequate amounts of private or semi-private open space for residents and users;
- Allows for permeability - consideration of the longer axis of the block;
- Ensures efficient use of land;
- Provides for further parceling or subdivision as necessary; and
- Considers underground and basement uses and subdivisions.

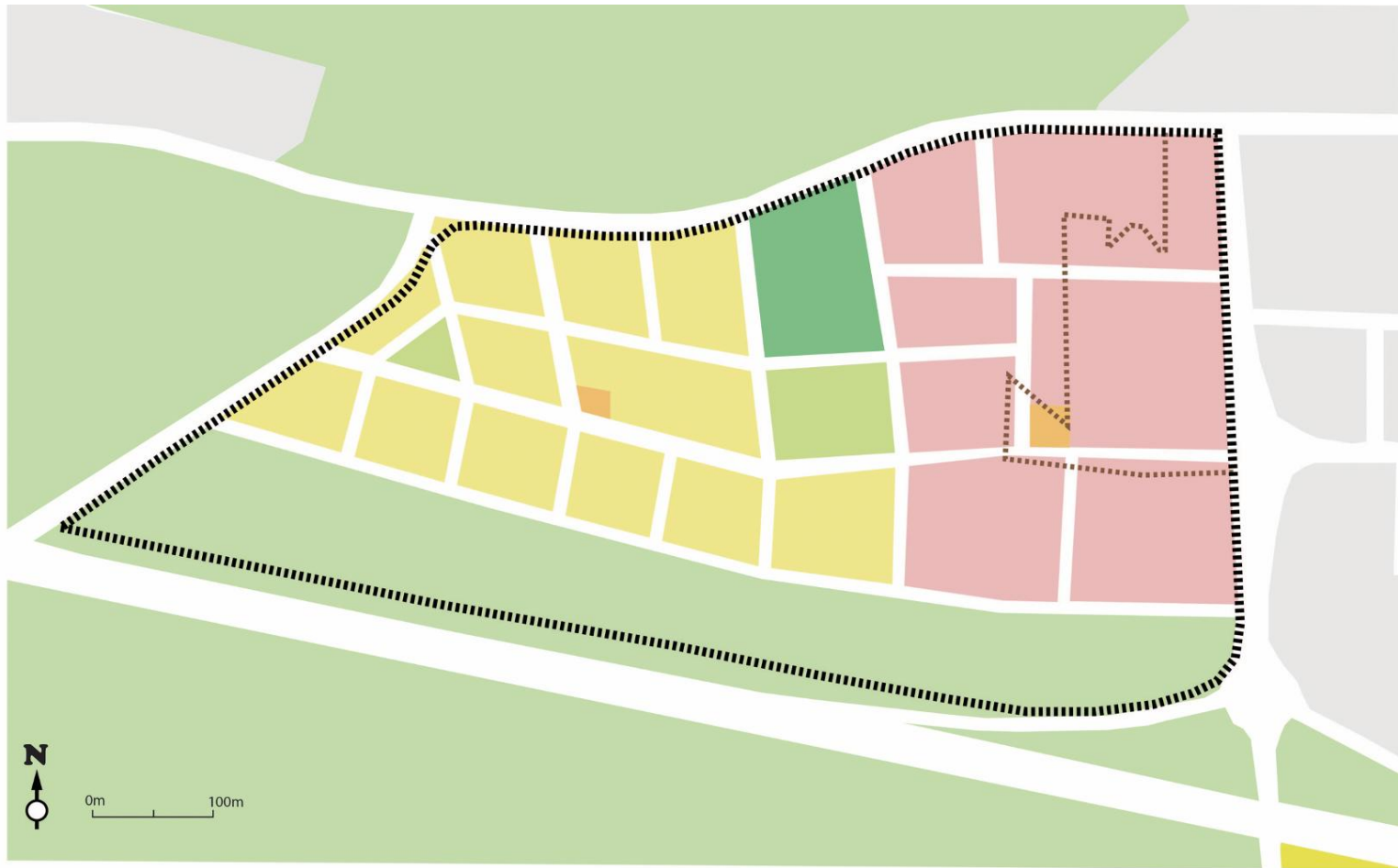
- 案例解析2课时

- **Grange Castle Site – Urban Block**





- **Monsteravin Site, Kildare – Function Map**



# References (initial)

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