

1.02

- "Buildings do not exist in isolation" P.1.02 (They exist for human activities, Socio-cultural, economic, and political needs)
- Before designing a building, it's important to consider focusing on human comfort base on the surrounding microclimate, topography, and natural habitat.
- Environmental and regulator factors require a limitation of the sizes, shapes, and land uses of the building.
- A transportation system, and utility are unavoidable



1.03

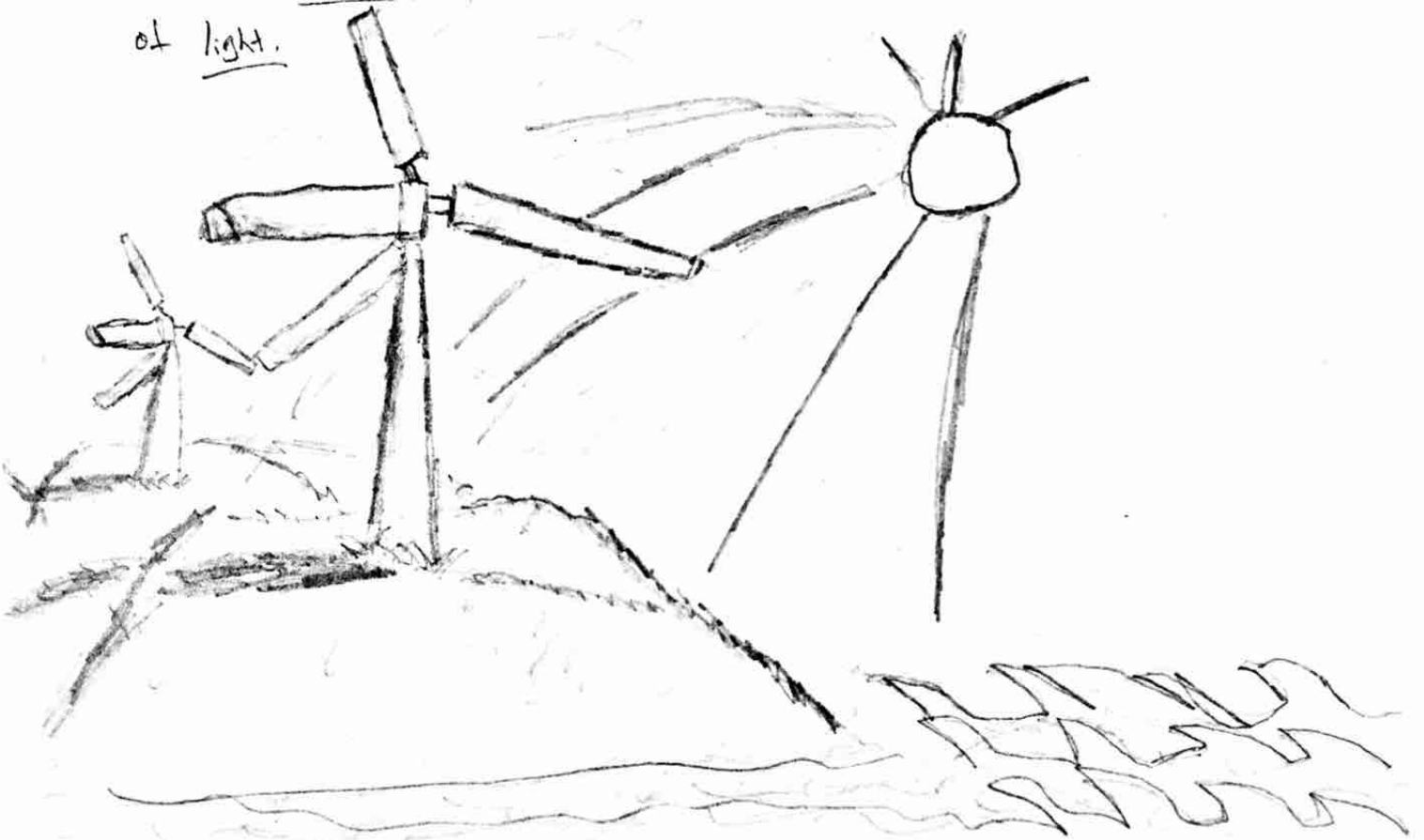
- Reduce resource consumption
- Control the usage of materials, energy and spatial resources on buildings throughout the process of siting, designing, construction, maintenance and renovation, in order to reshape the communities.

1.04

- "Green buildings" and "Sustainable buildings" are designed for reducing pollution and restoring damaged habitat.
- "Water Efficiency" is designed for the appropriate usage of water.

1.05

- Encourage usage of renewable, nonpollution energy to prevent global warming. (on buildings)
- Encourage usage of locally available, renewable, recycled materials, and reduce wasting.
- Enhance human comfort and encourage to control usage of light.



2.02

- Architecture and Building Construction are different.
- Architecture is the art of building, while Building is only one of the several critical construction factor in the execution of architecture.

2.03

- Structural System

- Columns, beams, walls
- To support the gravity of the extension above the foundation of a building.

- Enclosure system

- Roof, exterior walls, windows, and doors
- The shell or envelope of a building.

- Mechanical system

- Water supply, heating, air conditioning, electrical system
- Fire fighting system, elevator, and recycling system.
- Provide essential services to a building.

2.05

- Model code
- International building code
- Companion code
- Federal Requirement.

2.06

- Static loads : exert a constant amount of force

- Live loads. (comprise movable loads, collected snow, rain or moving equipment. Ex: A person)

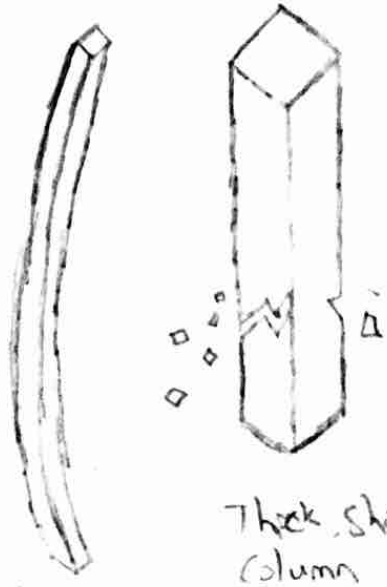
- Dead loads: the intrinsic (self) weight of a structure, excluding the weight of other elements. A structure

- Dynamic loads: exert a vary amount of force, ex: Bridge

- Design of wind load must consider any horizontal direction of the wind.

## 2.13

- Thick columns are subject to failure by crushing.
- Thin columns are subject to failure by buckling.



Thin, long column

Thick, short column

## 2.14

### - Beams

- Carry and transfer transverse load across space to supporting elements.
- Depends on the materials that it will bend or stay constant.

## 2.17

### - Frames

- Connected by 2 columns with 1 beam supporting the connection.

#### - Fixed Frame

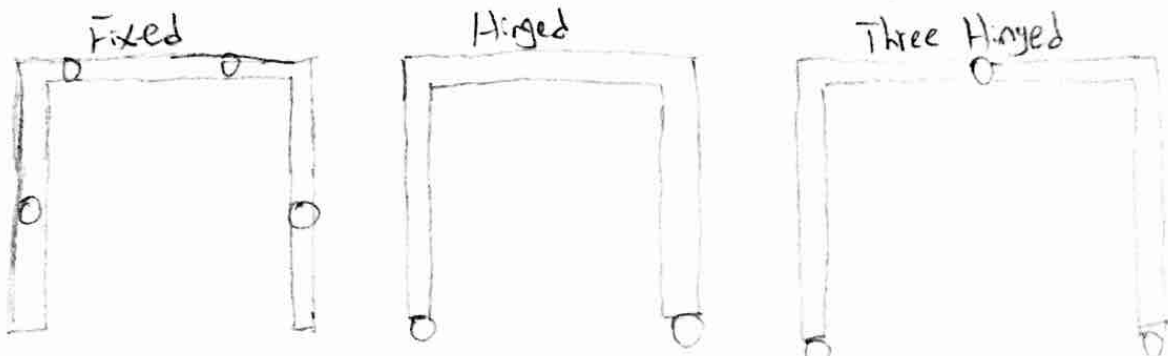
- More resistant to deflection than a hinged frame.
- More sensitive to support settlements.
- Connected to its supports with fixed joints.

#### - Hinged Frame

- connected with pin joints
- prevent high bending stresses.

#### - Three Hinged Frame

- Connected with 2 rigid sections and with pin joints



2.19

### - Structural Units

- Combines both column, beam, slabs and loadbearing wall.

2.22

- "The structural elements of a building must be sized, configured, and join to form a stable structure under any possible load condition."
- The structural elements of a building should also withstand any vertical gravity loads, wind and seismic forces.

2.30.

### Joints & Connections

- Allows forces to be transferred from structural element.
- Butt joints
  - Allow one of the elements to be continuous
  - Require a third mediating element to make the connection.
- Overlapping joints
  - Allow all of the elements to be continuous.
  - The joining element can be molded or shaped
- Connector
  - Can be form of a point, a line, or a surface

12.02 - 05

Input

- Raw materials
- Energy
- Water

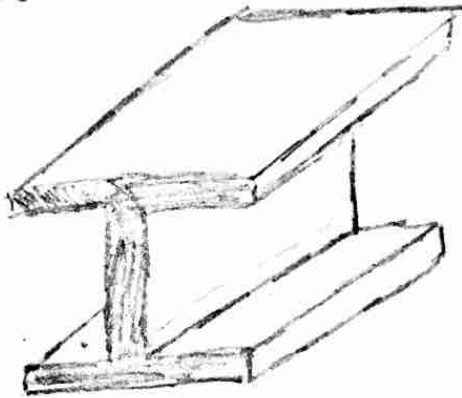
Concrete

- Cement
- Water
- Aggregate

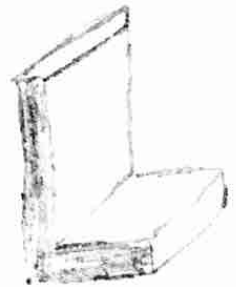
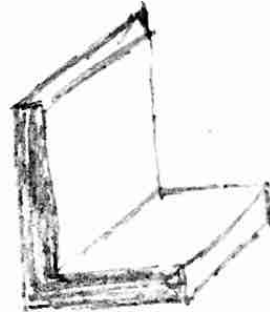
Water Cement Ratio

- Controls the strength, durability and watertightness of hardened concrete.

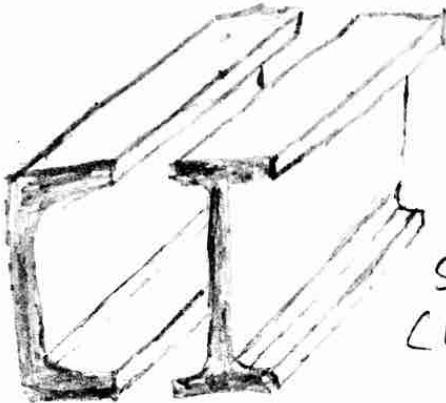
12.08



W Shape (wide flange)



L Shape (could have equal and unequal leg angles)



S shape  
(American Standard)

C Shape  
(American Standard Channel)