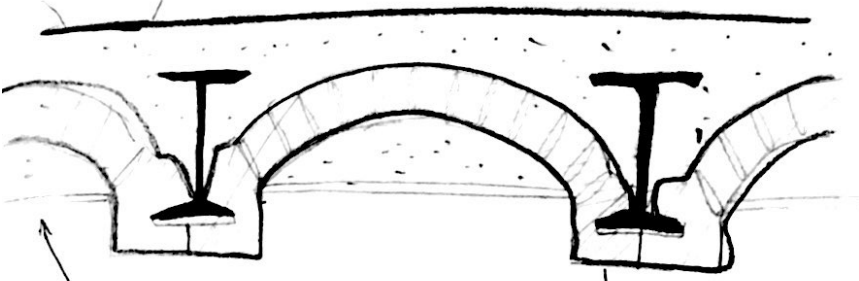


A concrete slab over the arches creates a level floor



Steel tie rods through the beam webs resist the thrust of the arches

Special bricks or tiles protect the beam flange against fire

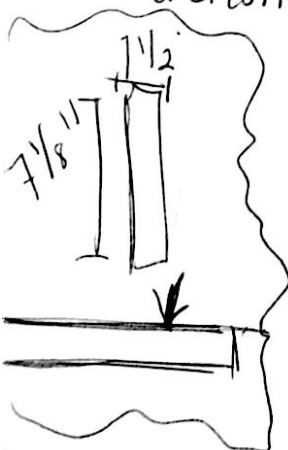
Structure + Envelope (wrapping) of the building

- protects → sun, rain (water), snow, wind Heat/Cold
- envelop → wrapping the building from its environment and adjust the environment and protect us
- waterproofing - glass, plastic rubber

steel ribs → masonry bricks thick  
 & limited made of stone in the back days  
 A truss make a big span.

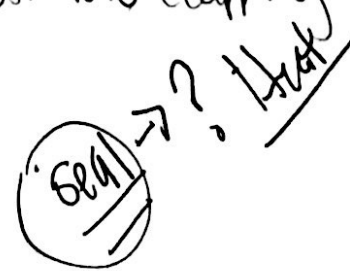
- membrane (EPDM) - made of synthetic products. manufacture into sheets prevents water damage - ~~water~~
- insulation - to keep the cold out and heat warm in (winter) to keep the heat out and cold inside (summer)
- passive - the building its on its own way, be comfortable on its environment, creating a safe environment. not harming the environment.

- the library the number one thing you want to notice is the space  
 - relationship between length and width, clear proportion



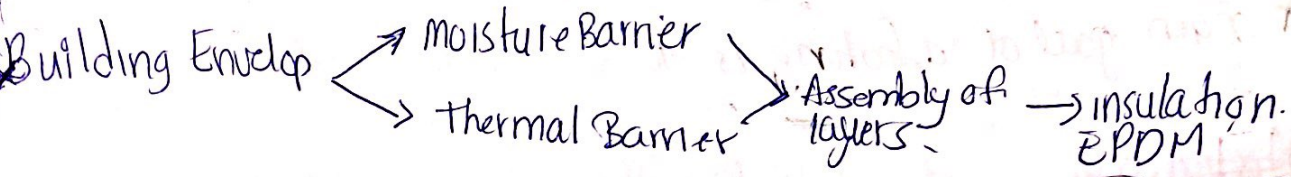
- ordered system =
- beams / joists
- rafters
- trusses
- slabs
- Arches / Vaults
- Space Frame

structure (wrapping the building)



Protection → Low slope (flat)  
 ↓ gravity  
 → sloping

\* roofs are never flat because the water has to go and it would stay on the roof.



03.27.2017

April 06, 2017

Foundations: spread the load into the earth.

concentrated vs spread  
 (ex: what would you rather step on you a heel (concentrated) or a flat shoes (spread))

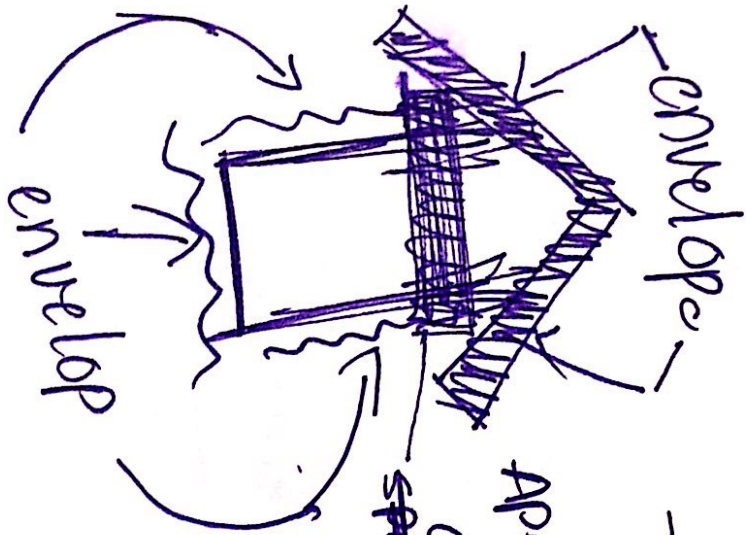
- stable condition - equal force from both sides (bottom and top).  
 down up.  
 Dirt and rock created the force up to maintain and support the building (you want to know what type of rock and dirt is on the land to construct a building)
- 1st step of foundation  
 - Geo-technical investigation - you do this at the very beginning to know the properties of the dirt and rock.
  - examine the rock and dirt (after)
  - compressive strength (force), resistance, and how down should we go from the earth?
- \* Bedrock - rock that has not been disturb by nature (natural state)
- \* Deeper you go the more expensive it gets and dangerous.
- Uniform settlement is better than differential settlement
- main job foundations
  1. must be safe against failure and collapse
  2. During life of the building it should not damage structure or impair function
  3. must be feasible, economical and practical (no impact to the neighbors)

- = classification to:
- ↳ particle size - live → dead
  - ↳ presence of organic content = settlement
  - ↳ sensitivity to moisture content
  - use test pit (test bearing) to determine
    - ↳ water table (soil saturated)
    - ↳ examine properties of the earth



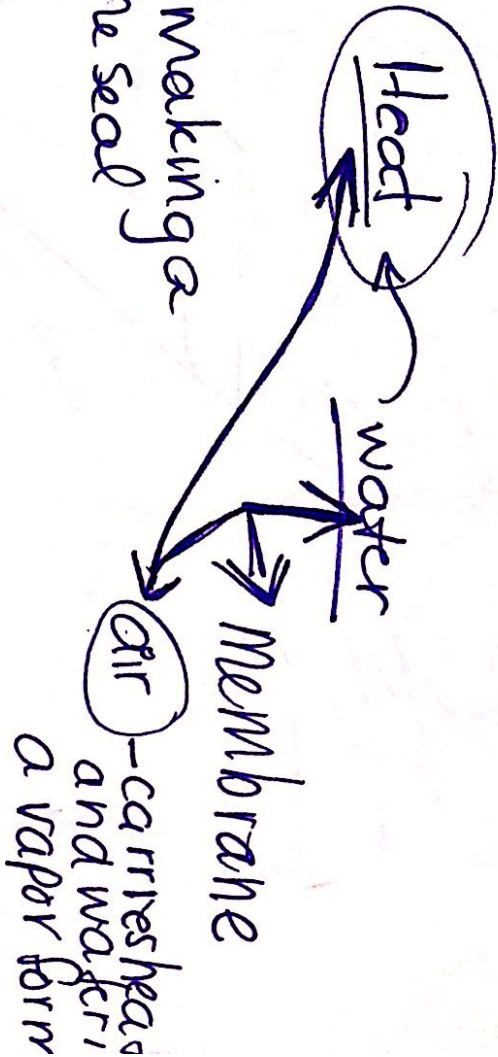
interface = envelope - exterior relationship

- interior and exterior relationship
- safety and comfort
- regulating the body temperature. (not in space)

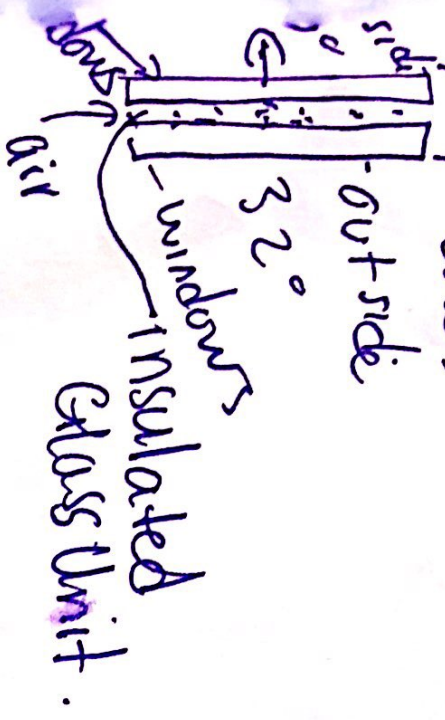


Aperture: system  
opening seals?

\* Aperture making a hole in the seal

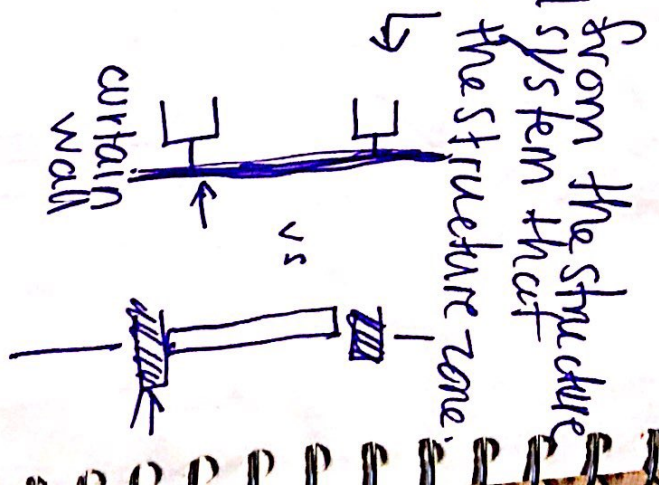


load bearing wall - the envelope is not part of the structure.  
 curtain wall - envelope system is a different system independent of the structure.  
 CONDENSATION: envelope system becomes the envelope.



- Primary functions of an exterior wall

1. Keep water out
2. prevent air leakage
3. control light radiation of heat
4. control conduction of heat
5. control sound





- Secondary functions of an exterior wall

7. resist wind loads
8. control water vapor
9. adjust to movement
10. resist fire
11. weather gracefully
12. easy to install (economical)

\* Transparency - architect love it.

## Aluminum's properties:

1. strong
2. light weight
3. conducts heat rapidly
4. high co-efficient of thermal expansion

## Aluminum's advantage for use in cladding systems:

1. protects itself against corrosion.
2. accepts and holds.