

CHAPTER #1

BUILDINGS

ARE MADE FOR A PURPOSE EITHER CULTURAL, SOCIO-ECONOMIC & OR POLITICAL NEEDS

THEY GET ADAPTED BY THE CONDITIONS OF THE AREA
EX. WIND, SUN, RAIN, SNOW.

THIS NESECITIES DRIVES YOU THE TERM

SUSTAINABILITY

A FORM OF DEVELOPMENT THAT MEETS THE NEEDS OF THE PRESENT WITHOUT COMPROMISING THE NEEDS OF THE FUTURE.

→ **GO GREEN!**

SUSTAINABILITY ALSO TRY TO MINIMIZE THE USE OF CONSTRUCTION MATERIALS

SUSTAINABILITY LEADS YOU TO

GREEN BUILDING & SUSTAINABLE DESIGN

→ WHEN BUILDING AND DESIGN ARE MADE IN AN ENVIRONMENTAL WAY

SUSTAINABLE SITES:
↓
REDUCES THE POLLUTION OF THE CONSTRUCTION ACTIVITY

WATER EFFICIENCY:

↓
HELPS REDUCING THE DEMAND OF CLEAN WATER & THE GENERATION OF WASTE WATER BY USING RAIN WATER

ENERGY & ATMOSPHERE:

↓
ENCOURAGE EFFICIENCY IN TERMS OF ENERGY USE & REDUCES THE ENVIRONMENTAL AND ECONOMIC IMPACT OF FOUL FUELS.

MATERIALS & RESOURCES:

↓
SEEKS TO MAXIMIZE THE

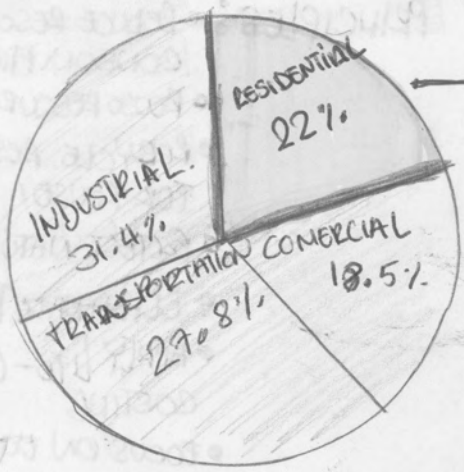
INNOVATION IN DESIGN

INNOVATIONS SET BY THE LEADERSHIP IN ENERGY & ENVIRONMENTAL DESIGN (LEED) & DEMONSTRATE AN INNOVATE PERFORMANCE IN GREEN BUILDING.

REGIONAL PRIORITY

PROVIDE INCENTIVES FOR PRACTICES THAT ADDRESS GEOGRAPHICALLY ENVIRONMENTAL PRIORITIES.

- ### PRINCIPLES:
- REDUCE RESOURCE CONSUMPTION
 - REUSE RESOURCES
 - RECYCLE RESOURCES FOR REUSE
 - PROTECT NATURE
 - ELIMINATE TOXICS.
 - APPLY LIFE-CYCLE COSTING
 - FOCUS ON EQUITY



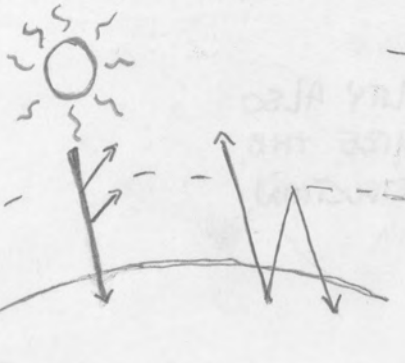
ENERGY CONSUMPTION BY (2012) DOE ANNUAL ENERGY REVIEW

BUILDINGS ARE RESPONSABLE

THE MAIN PROBLEM OF THE BUILDINGS AND CONTAMINATION IS ABOUT THE HEATING, COOLING & LIGHTING OF BUILDINGS.

THEREFORE

IS NECESSARY TO PROPERLY DESIGN BUILDINGS TO INCORPORATE NATURAL HEATING, COOLING & DAY LIGHTING STRATEGIES.



1. SUN LIGHT RADIATION IS REFLECTING TO THE EARTH & IS ADSORBED BY THE EARTH TO MAKE THE SURFACE OF THE EARTH.

2. THE SUNLIGHT TRIES TO GO BACK TO THE SPACE BUT INSTEAD IT GETS TRAP BECAUSE OF THE HUMAN POLLUTION & WASTE

THE GREEN HOUSE GAS (CHANGE IN CLIMATE)

~~THE BUILDING~~ CHAPTER #2

ARCHITECTURE

↓
THE ART OF BUILDING
↓
BUT IS NOT THE SAME AS BUILDING CONSTRUCTION

- INTERIOR
- SCALE
- PROPORTION
- ORGANIZATION OF INTERIOR SPACES
- OTHERS

• STRUCTURAL SYSTEMS

SUPPORTS & TRANSIT APPLIED GRAVITY & LATERAL LOADS SAFELY TO THE GROUND

• SUPER STRUCTURE (VERTICAL EXTENSION OF A BUILDING ABOVE THE FOUNDATION)

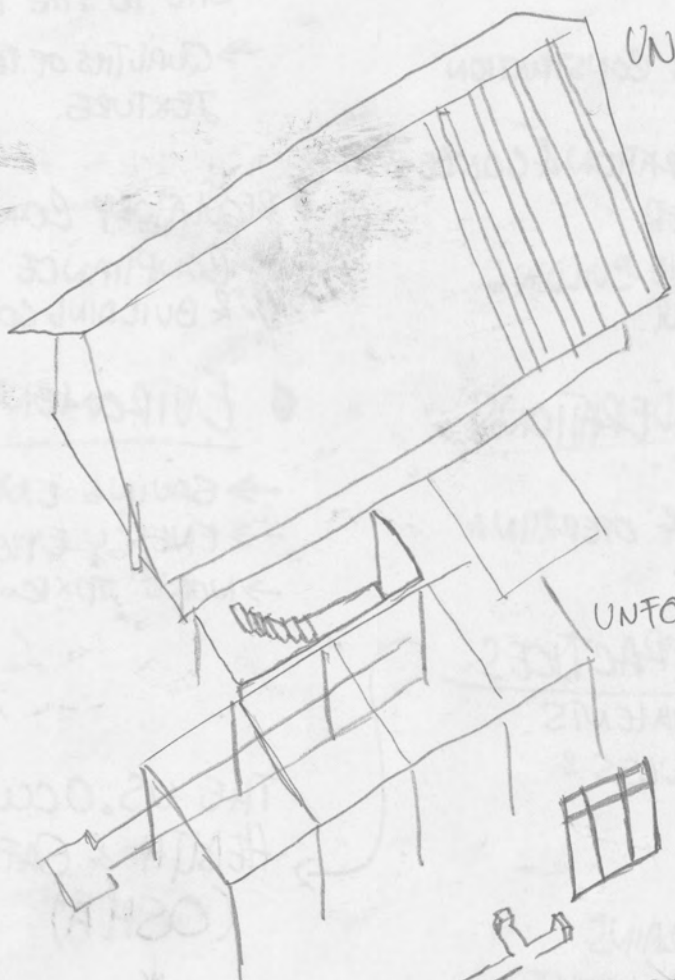
STRUCTURAL SYSTEM



IS DESIGN TO SUPPORT & TRANSMIT APPLIED GRAVITY & LATERAL LOADS SAFELY.



- THE SUPER STRUCTURE IS THE VERTICAL EXTENSION OF A BUILDING ABOVE THE FOUNDATION
- COLUMNS, BEAMS, & LOAD BEARING WALLS SUPPORT FLOOR & ROOF STRUCTURES
- SUBSTRUCTURES IS AN UNDERLYING STRUCTURE FORMING THE FOUNDATION OF THE BUILDING



UNFORMAT II B: SHELL

UNFORMAT II C: INTERIORS

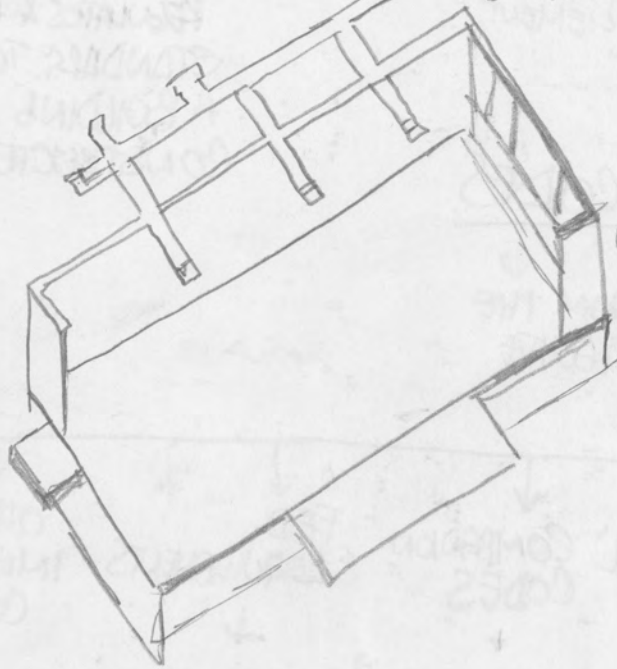
UNFORMAT II E: EQUIPMENT & FURNISHING

UNFORMAT II G: SERVICES

ENCLOSURE SYSTEM

THE ROOFS & WALLS OF A BUILDING

- SHELTER INTERIOR SPACES FROM INCLEMENT WEATHER.
- CONTROLS HEAT & AIR
- IT ALSO DAMS NOISE & PROVIDE SECURITY & PRIVACY



MECHANICAL SYSTEMS

IT PROVIDES ESSENTIAL SERVICES TO A BUILDING

- PORTABLE WATER
- THE SEWAGE DISPOSAL SYSTEM
- WASTE DISPOSALS & PESTICIDE SYSTEMS
- FIRE-FIGHTING SYSTEMS
- VERTICAL TRANSPORTATION (ELEVATOR/STAIRS)
- CONDITIONING OF THE PLACE
- ELECTRICAL SYSTEM.

● PERFORMANCE REQUIREMENTS

- STRUCTURAL
- FIRE ASSISTANCE
- THICKNESS OF THE CONSTRUCTION ASSEMBLIES
- CONTROL OF MIGRATION & CONDENSATION OF WATER
- ADAPTATION OF THE BUILDING TO THE SETTLEMENT

● ECONOMIC CONSIDERATIONS

- INITIAL COST
- MAINTAINANCE & OPERATING COST

● CONSTRUCTION PRACTICES

- SAFETY REQUIREMENTS
- ALLOWED TOLERANCES & APPROPRIATE FIT
- BUILDING CODE
- BUDGET CONSTRAINTS
- CONSTRUCTION EQUIPMENT
- BE PREPARE FOR INCREMENT WEATHER

● AESTHETIC QUALITIES

- RELATIONSHIP FROM THE SITE TO THE NEIGHBORHOOD
- QUALITIES OF FORM, MASSING, COLOR, PATTERN, TEXTURE

● REGULATORY CONSTRAINTS

- COMPLIANCE WITH ZONING ORDINANCES & BUILDING CODES.

● ENVIRONMENTAL IMPACT

- SAVING ENERGY & RESOURCES
- ENERGY EFFICIENTLY MANAGE
- NONE TOXIC MATERIALS.

THE U.S. OCCUPATIONAL HEALTH & SAFETY (OSHA)

REGULATES & SETS SAFETY STANDARDS TO WHICH A BUILDING MOST BE CONSTRUCTED

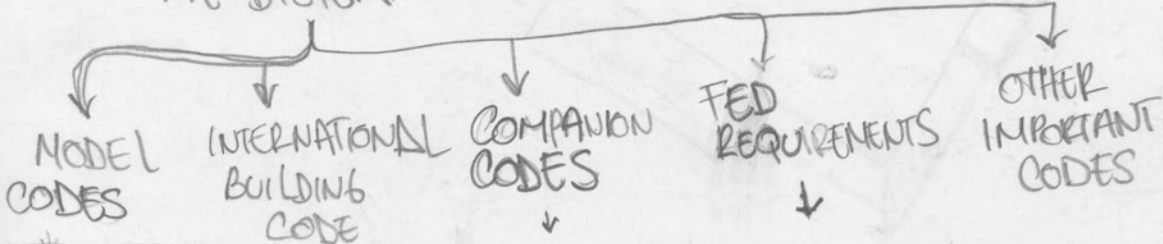
THERE ARE OTHER SOCIETIES SUCH AS THE AMERICAN SOCIETY FOR TESTING & MATERIALS (ASTM)

THE AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

THEY TEST THE PRODUCTS FOR SAFETY & A BETTER PERFORMANCE.

BUILDING CODES

REGULATIONS FROM THE GOVERNMENT TO REGULATE THE DESIGN



IS DEVELOPED BY NATIONAL ORG. IN ORDER TO MEET ANY PROVISIONS MODIFIED TO ADDRESS LOCAL REQUIREMENTS OR CONCERNS

GENERAL MODEL CODES SUCH AS (ICC) ORIGINATING FROM THE INTL. CODE COUNCIL (IBC) TO DEVELOPING CONTEMPORARY NATIONAL MODEL CODES

NEXT PAGE



MODEL CODES:

USUALLY DEVELOP FOR NATIONAL ORG. TO ADJUST ANY LOCAL REQUIREMENTS OR CONCERNS

INTERNATIONAL BUILDING CODE:

THERE ARE DIFFERENT MODEL CODES THAT WERE NATIONALLY USED:

- THE BUILDING OFFICIALS & CODE ADMINISTRATORS INTERNATIONAL (BOCA)
- THE INT. CONFERENCE OF BUILDING OFFICIALS (ICBO)
- THE SOUTHERN BUILDING CODE CONFERENCE (SBCC)

THEY PUBLISHED

- THE FIRST EDITION OF THE INTERNATIONAL BUILDING CODE (IBC)

THEY DEFINED

- USE OR OCCUPANCY,
- TYPE OF CONSTRUCTION.

COMPANION CODES:

IT REGULATES THE CONSTRUCTION OF ONE & TWO FAMILY DWELLINGS & TOWNHOUSES NO HIGHER THAN 3 STORIES.

IT ALSO REGULATES THE ALTERATION, REPAIR & RENOVATION OF EXISTING BUILDINGS INCLUDING HISTORICAL BUILDINGS & REGULAR ONES.

CODES I SHOULD KNOW:

- THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

IT CREATE DIFFERENT ALTERNATIVES TO THE IBC

ABOUT 5,000 WHICH ARE

- NFPA-101 (FIRE PROTECTION)
- NFPA-70 (ELECTRIC CODE) SAFETY REQUIREMENTS IN THE ELECTRIC AREA.
- NFPA-13 (NECESSARY) REQUIRES THE INSTALLATION OF FIRE SPRINKLERS.

FEDERAL REQUIREMENTS:

- AMERICANS WITH DISABILITIES ACT (ADA)
 - * ENSURES THAT ALL BUILDINGS MUST HAVE ACCESS FOR PEOPLE WITH MENTAL AND PHYSICAL DISABILITIES

- THE ARCHITECTURAL BARRIERS ACT
 - * SAME SHIT BUT IS RUN BY AN INDEPENDENT GOVERNMENTAL AGENCY

- THE FEDERAL FAIR HOUSING ACT.
 - * REQUIRES ALL RESIDENTIAL COMPLEXES OF FOUR OR MORE DWELLING UNITS CONSTRUCTED AFTER MARCH 1991 TO BE ADAPTABLE FOR USE BY A HANDY PERSON.

CHAPTER #12

TYPES OF BUILDING MATERIALS:

THE MOST EFFECTIVE MATERIALS ARE THOSE THAT ARE COMBINE THE ELASTICITY & STIFFNESS

- BRITTLE MATERIALS → THEY ARE NOT AS SUITABLE FOR STRUCTURAL PURPOSES.
- STIFFNESS: IT RESIST DEFORMATION.



* THE DIMENSIONAL STABILITY OF A MATERIAL THAT RESPONDS TO CHANGES TEMPERATURE, MOISTURE AFFECTS THE THE WAY OF HOW IS IT GOING TO MIX/LINK WITH OTHER MATERIALS

THE RESISTANCE OF THE MATERIAL TO VAPOR & WATER IS IMPORTANT SO IT DOES NOT GETS EXPOSED TO WEATHER OR MOIST. IN ADDITION THE MATERIAL HAS TO HAVE A THERMAL CONDUCTIVITY IN ORDER TO BE MANIPULATED.

○ A MATERIAL MUST BE TRANSMITTING / ABSORBING:

- VISIBLE LIGHT
- RADIANT HEAT

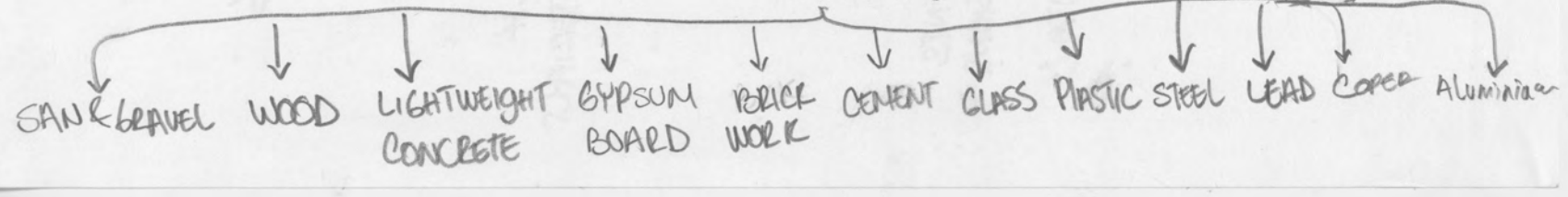
○ THE DENSITY OR HARDNESS OF A MATERIAL HAS TO RESIST:
- FIRE → AND NOT PRODUCING ANY SMOKE OR TOXIC GASES.

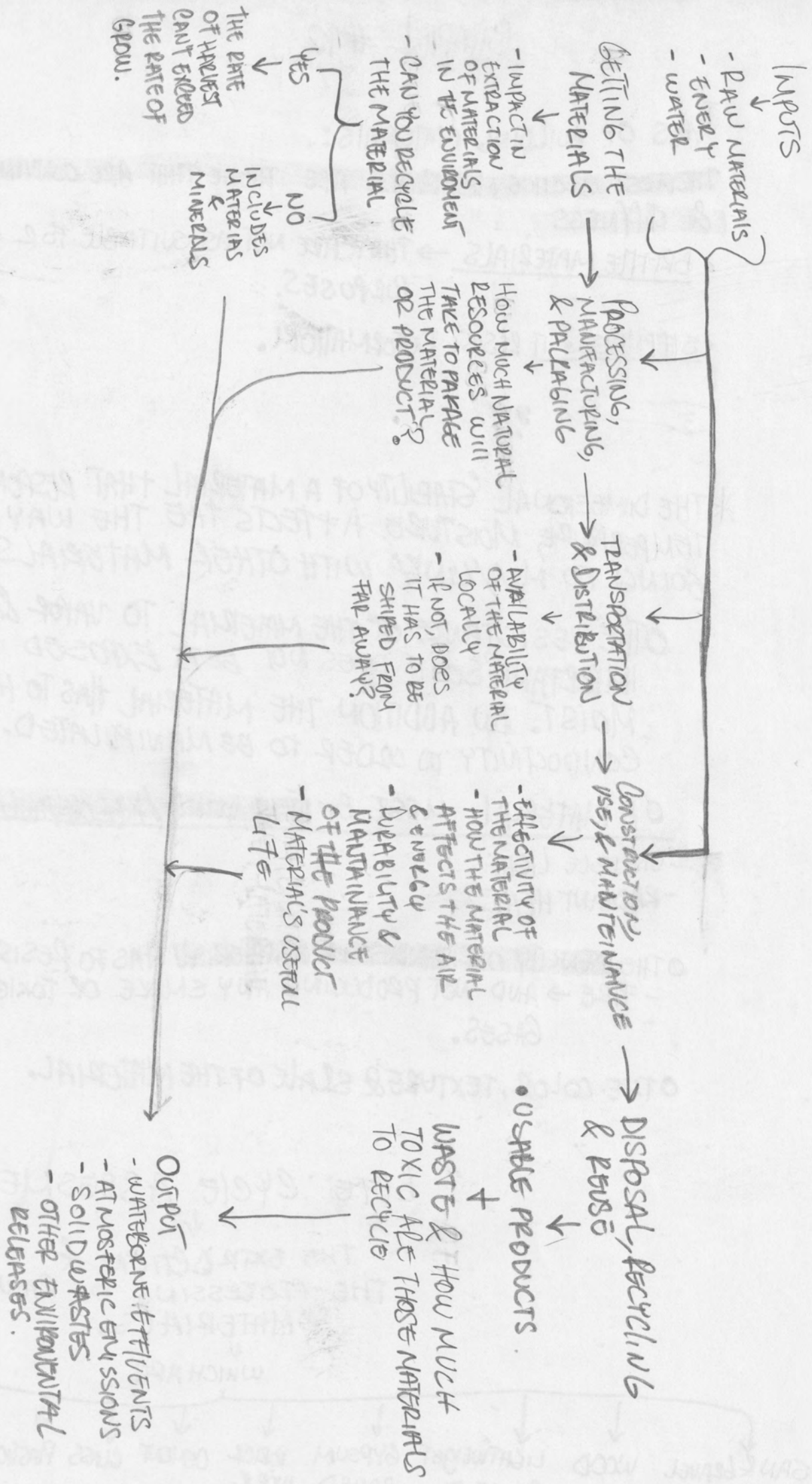
○ THE COLOR, TEXTURE & GRADE OF THE MATERIAL.

LIFE CYCLE ASSESSMENT

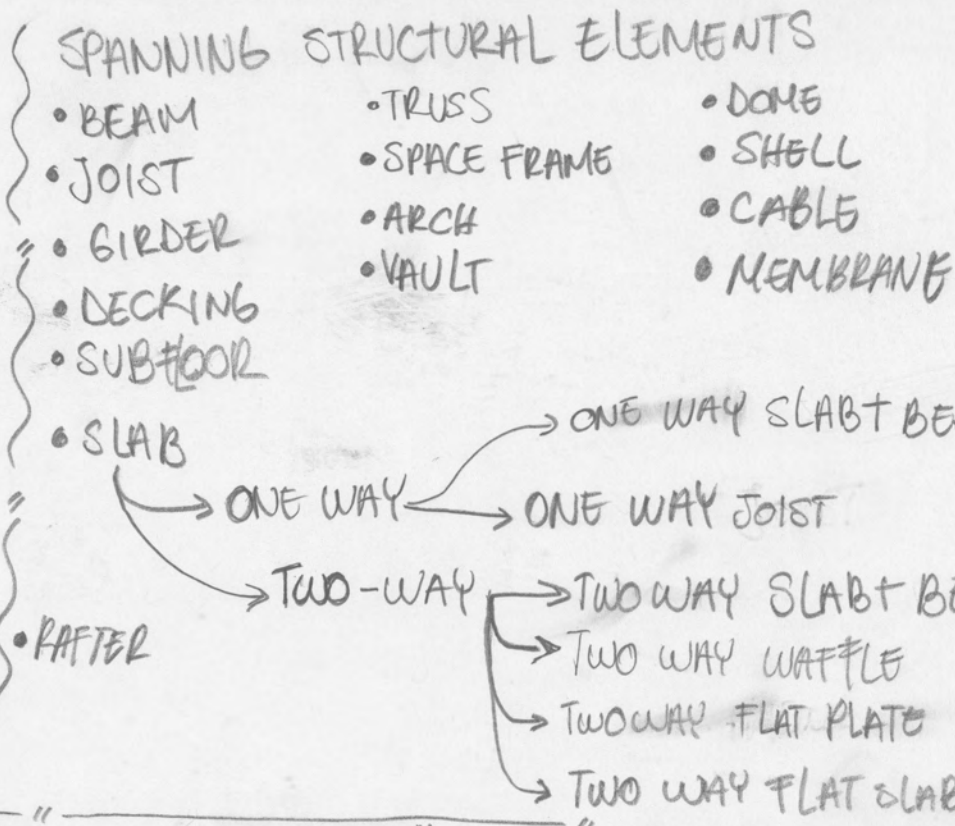
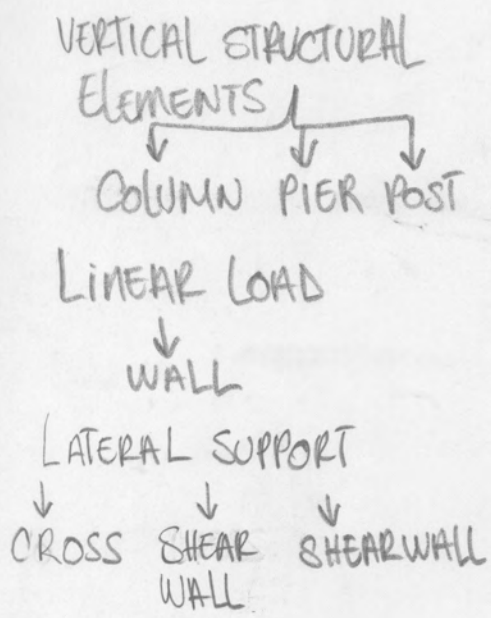
↓
THE EXTRACTION & THE PROCESSING OF RAW MATERIALS.

↓
WHICH ARE

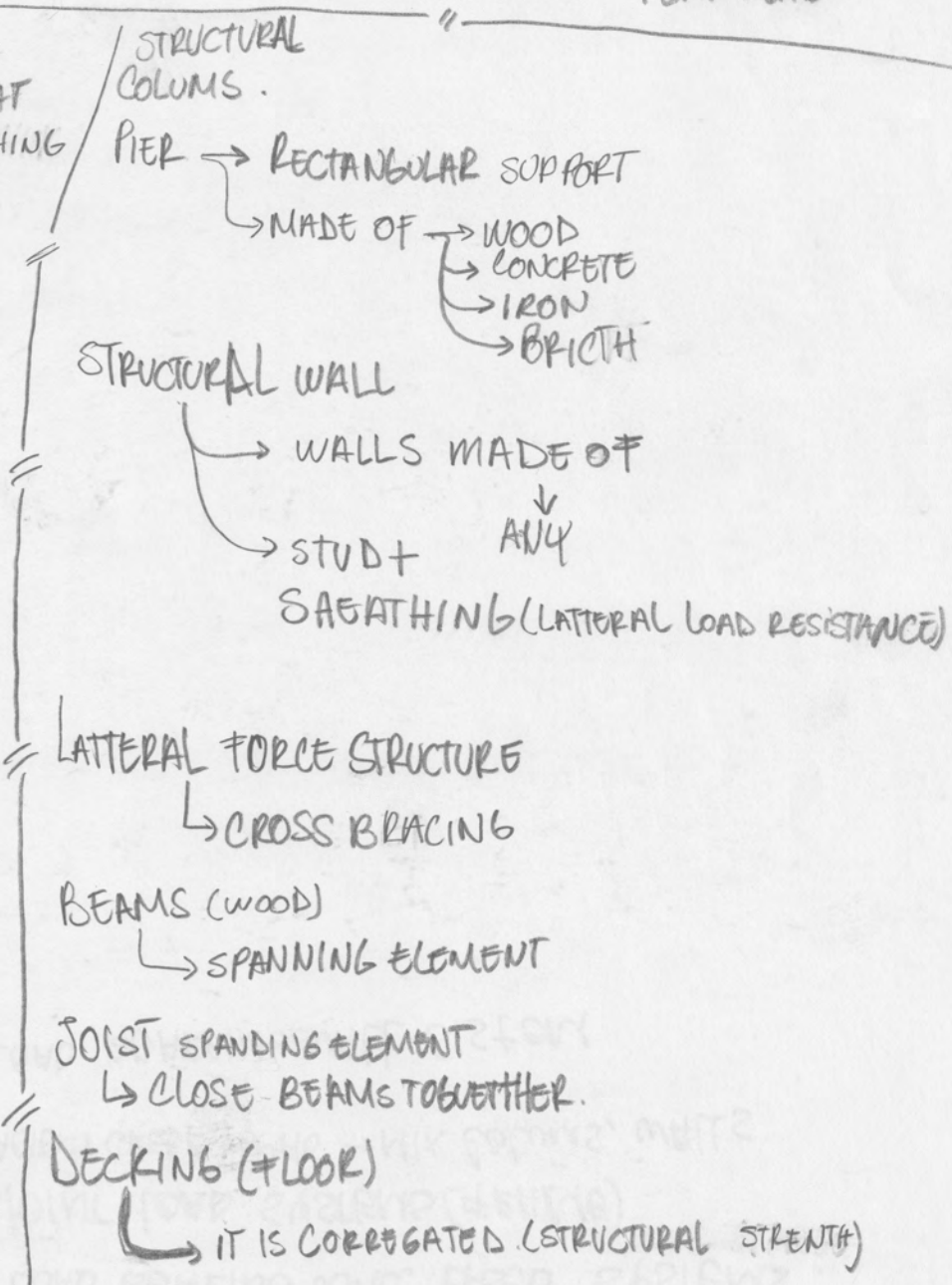




VOCABULARY



"MOMENT"
IT A FORCE THAT
MAKE SOMETHING
ROTATE



RAFTERS → ANGLE BEAMS

TWO WAY FLAT PLAT → ?

WAFFLE SLAB



SPACE FRAME

VAULTS → OPEN SPACES

TENSION ROAD STRUCTURES

STRUCTURAL TYPOLOGIES

LOAD BEARING WALL-BASED SYSTEMS

POINT LOAD SYSTEMS (FRAME)

ACIENT GREEK TEMPLE → MIX COLUMNS, WALLS

LOAD BEARING WALL SYSTEM

