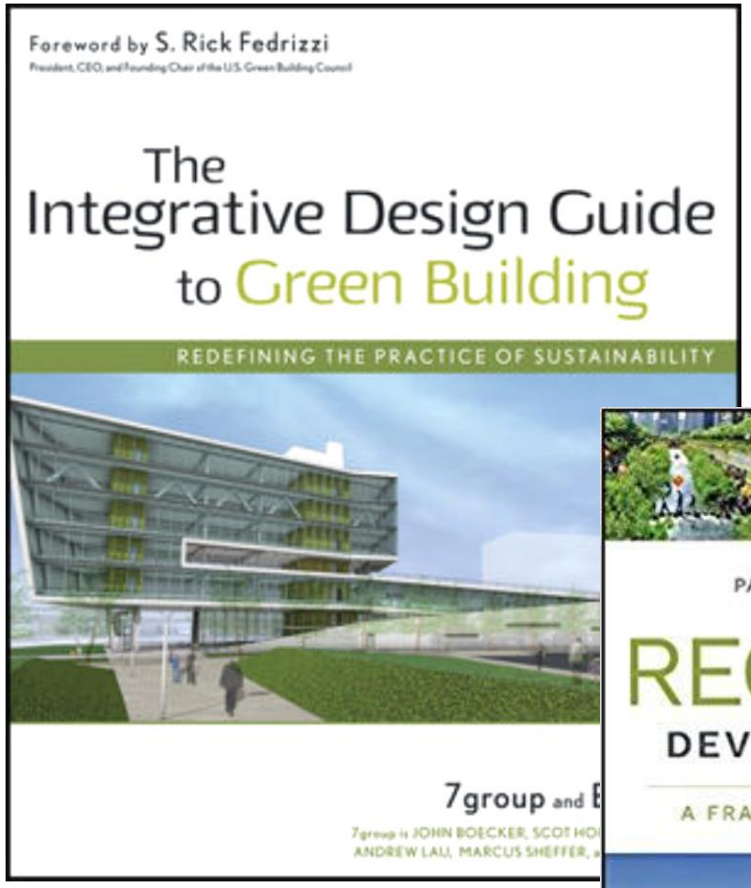
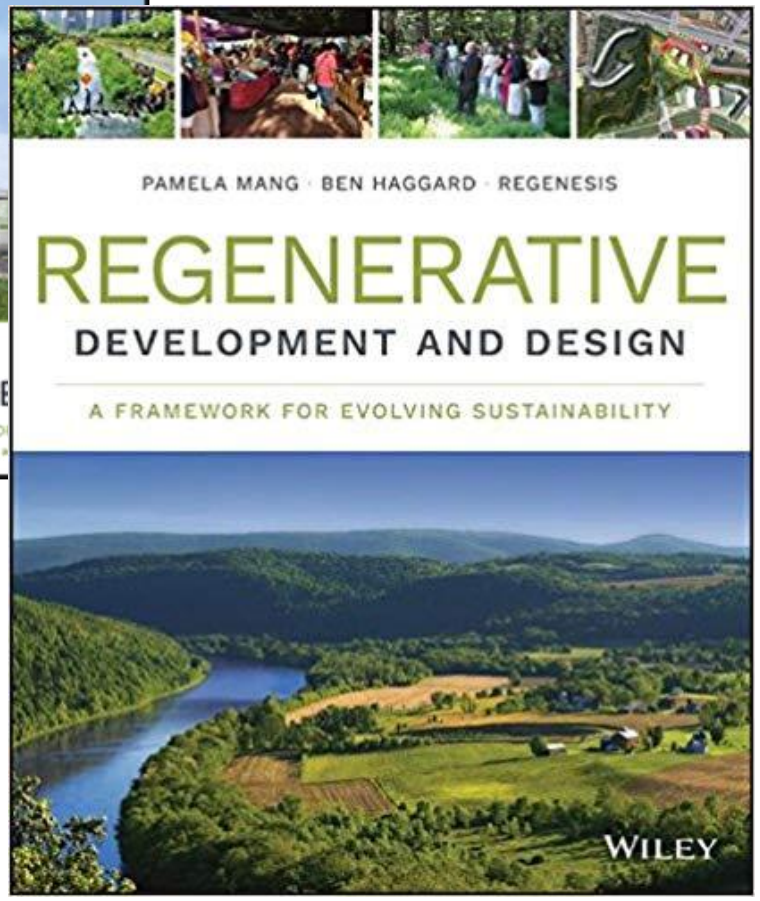
The Discovery Phase

جلسه چهارم- مبانی طراحی محیطی، نظریه ها و روشها

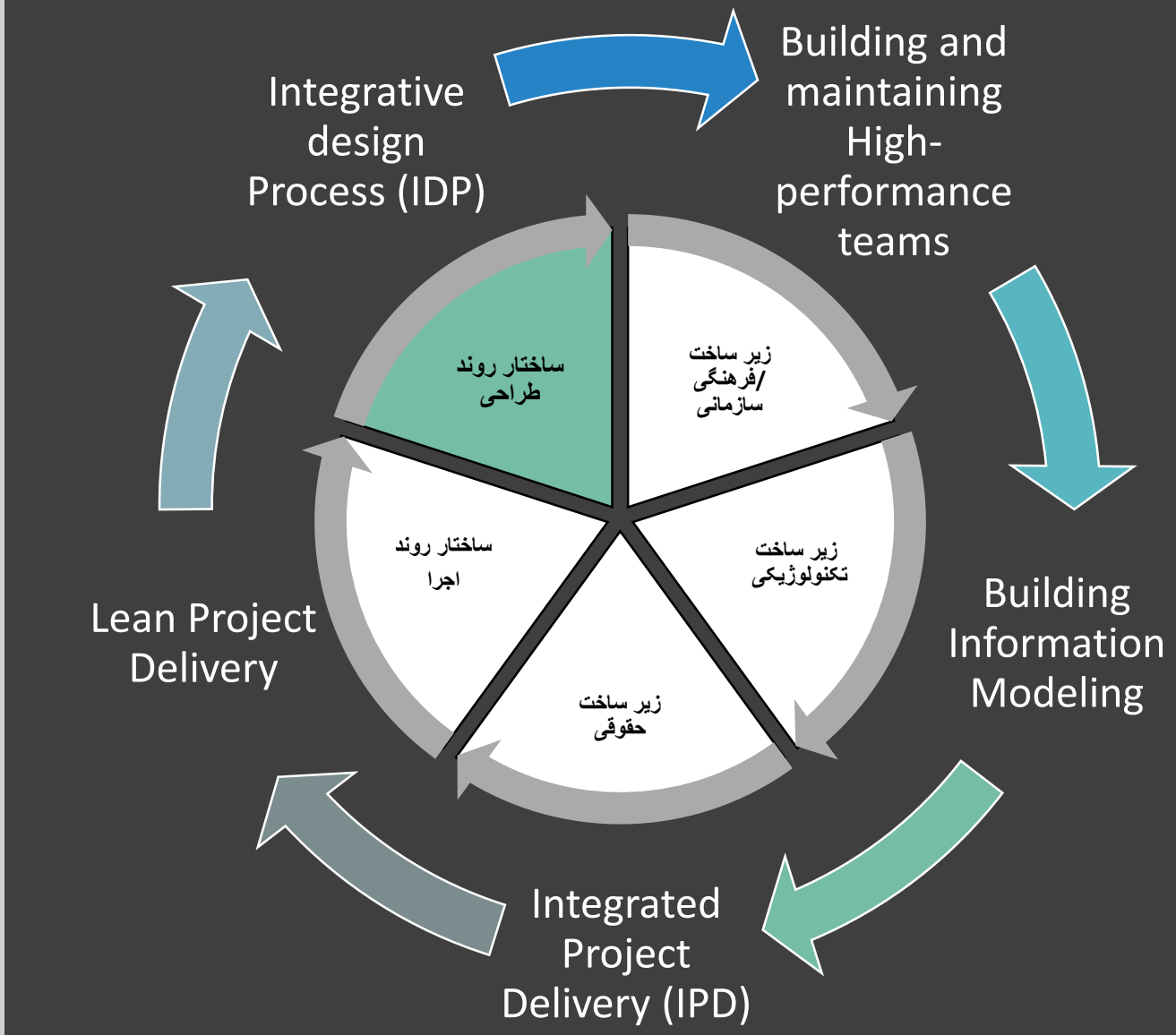
فروردین ماه 1399



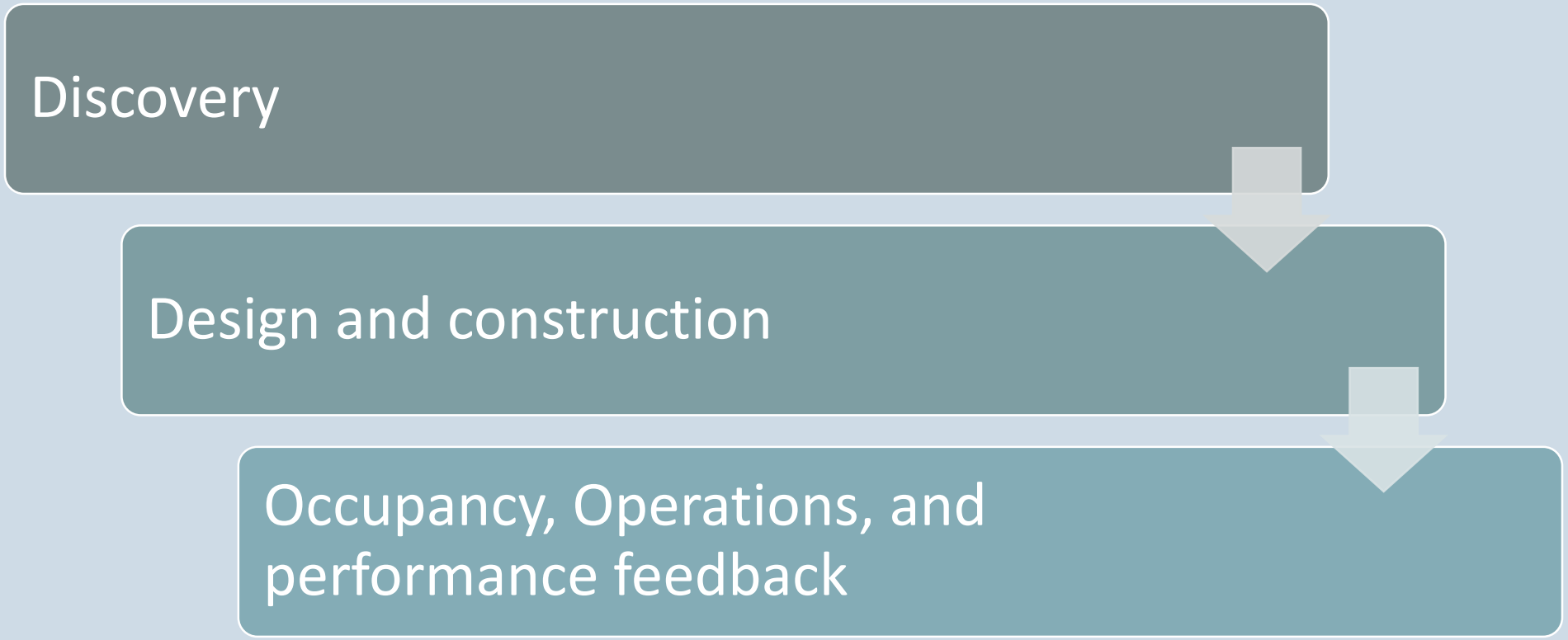


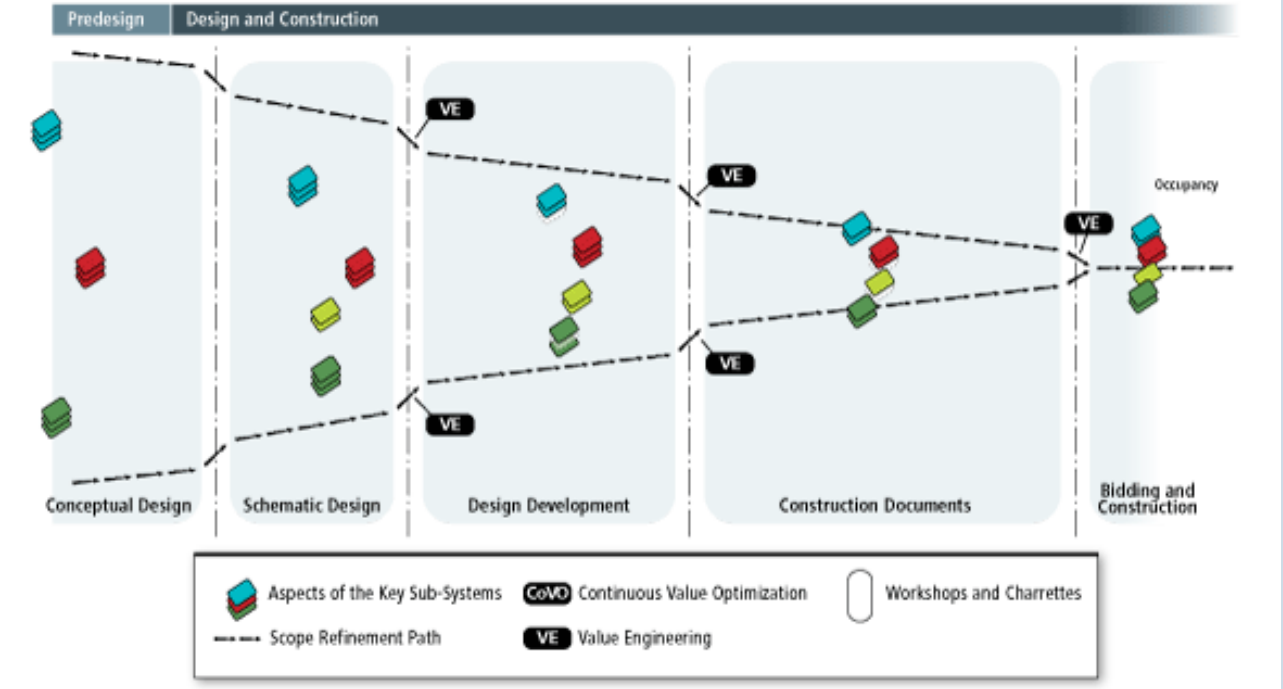
Introduction

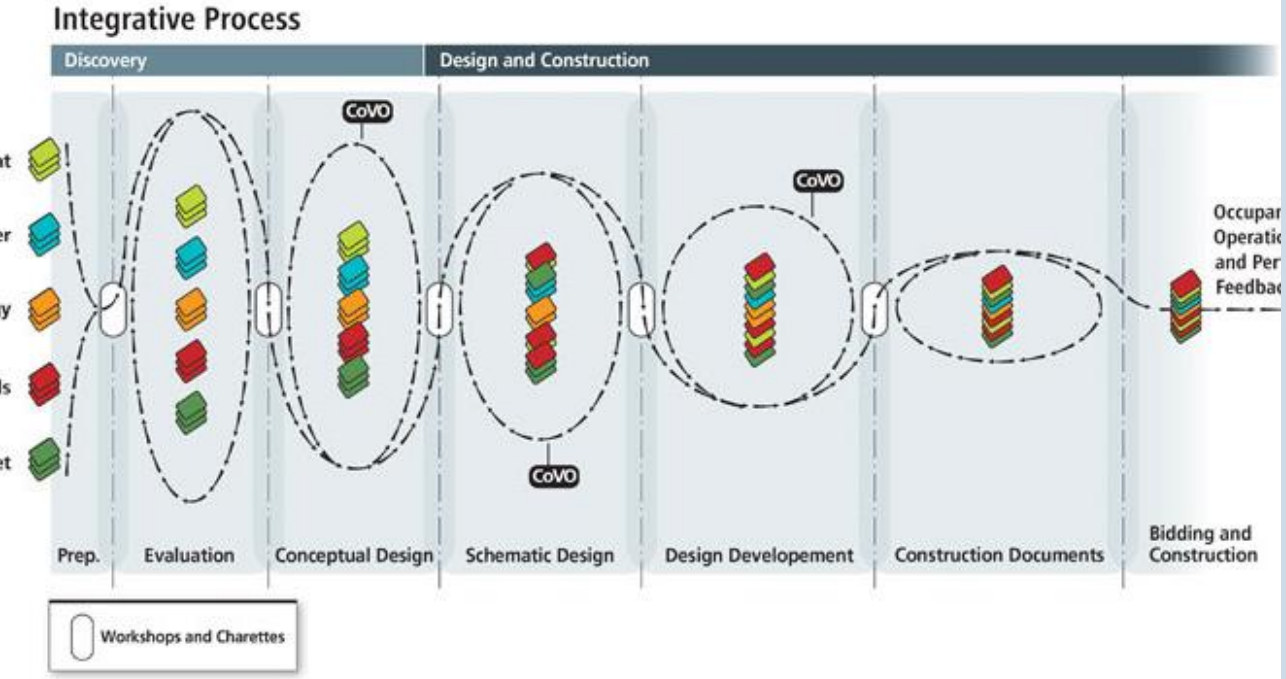
- The Discovery Phase
- The Four Key sub-systems (Habitat, Water, Energy, Materials)



Three part Structure



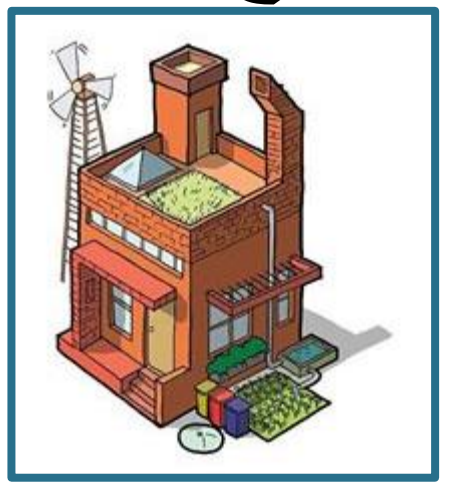




IDP vs. Traditional Design Process

- Same time scale
- Discovery twice the predesign
- After each charrette the scope of options becomes more focused.
- Continuous value optimization as opposed to discreate value engineering

مدل ذهنی: از تکنولوژی و محصولات تا طرز تفکر صحیح!

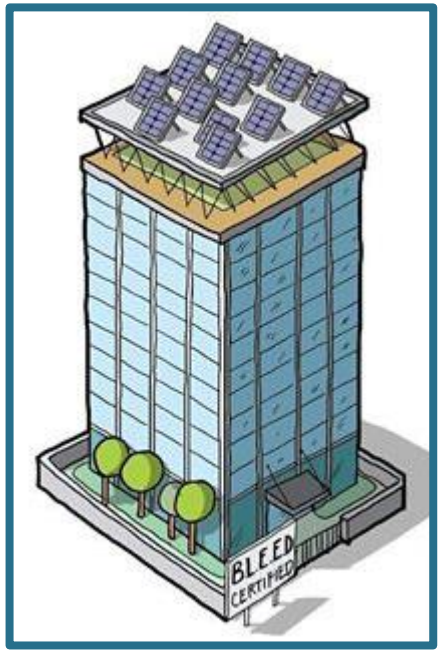


MENTAL MODEL
Client, design, and building teams' mind-set, attitude, and will

PROCESS
Integrated, all parties engaged-system optimization through iterative analysis

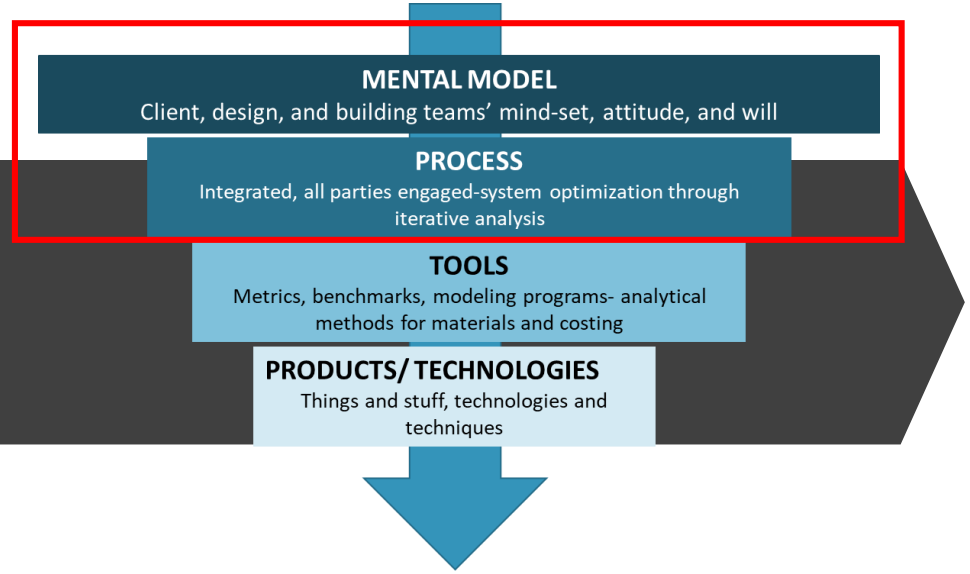
TOOLS
Metrics, benchmarks, modeling programs- analytical methods for materials and costing

PRODUCTS/ TECHNOLOGIES
Things and stuff, technologies and techniques



"…This change is related to a shift in mind-set from the age of specialization into the dawning age of integration- a mental model of exploring interrelationships that contribute to the health and wealth of each unique place."

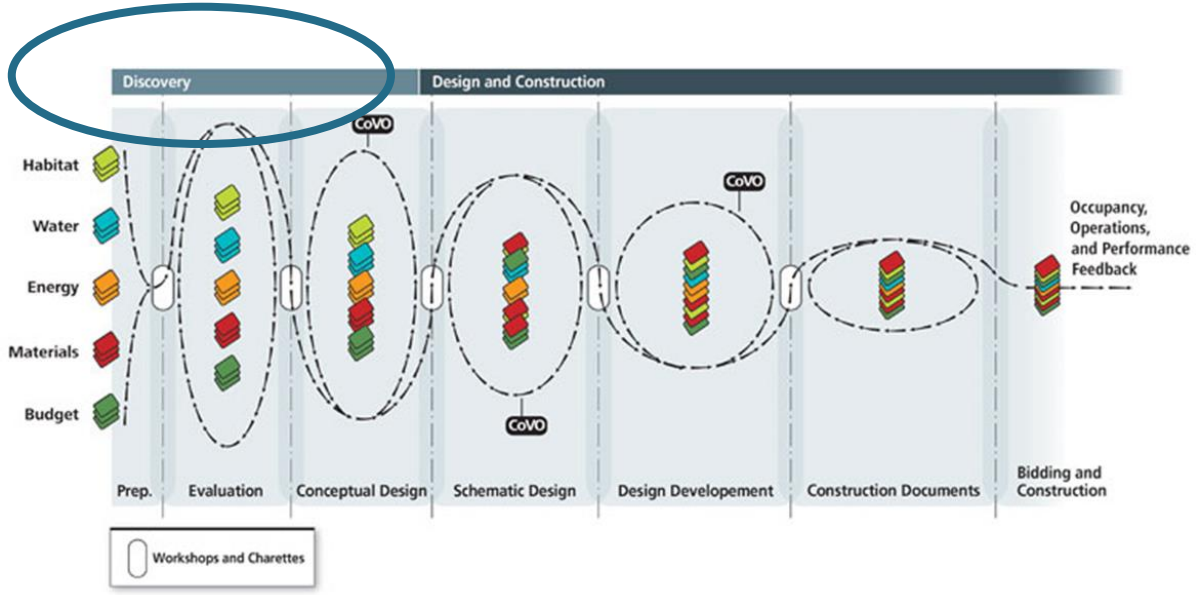
Roadmap to Success



- Creating the foundation for working together:

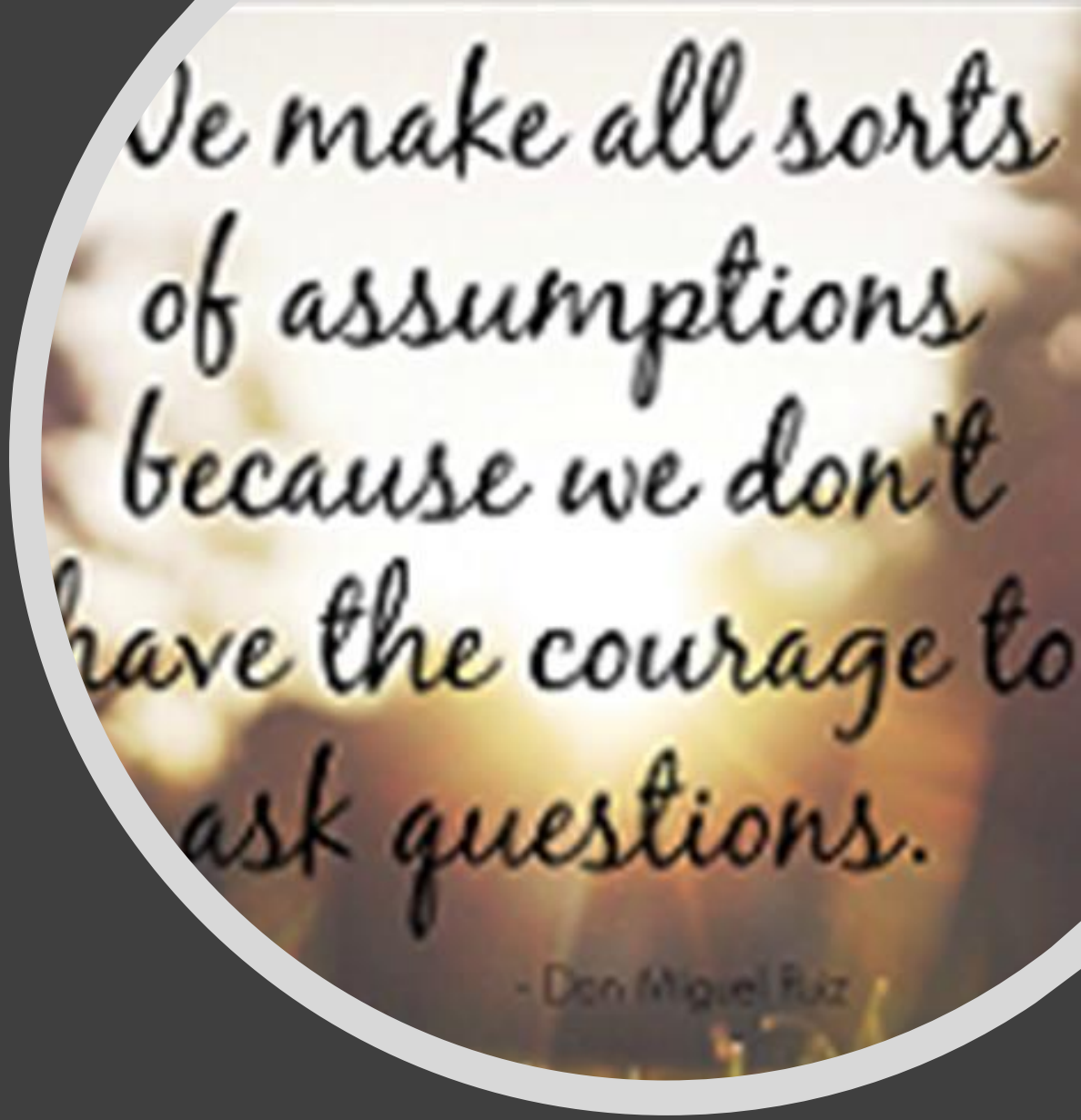
Everybody **E**ngaging **E**verything **E**arly

- The Key relationships: building systems, project and the larger system it inhabits
- To illuminate these relationships:
  - Question assumptions
  - Create alignment
  - Foster an iterative process
  - Integrate intentions with purpose



Questioning Assumptions

- Fundamental role of questioning in learning
- Engaging in the process for finding the right questions.
- Having a clear view of all possibilities.
- Sometimes assumptions are so deeply ingrained that we do not recognize them as assumptions.



Questioning Assumptions

- The story of the international corporate headquarters project

-Why do you need this building?

we need more space.

-**Why do you need to house the workforce?**

To achieve a higher level of effective communication.

-Why will they interact better if you build the design concept that's already up there on the wall?!!

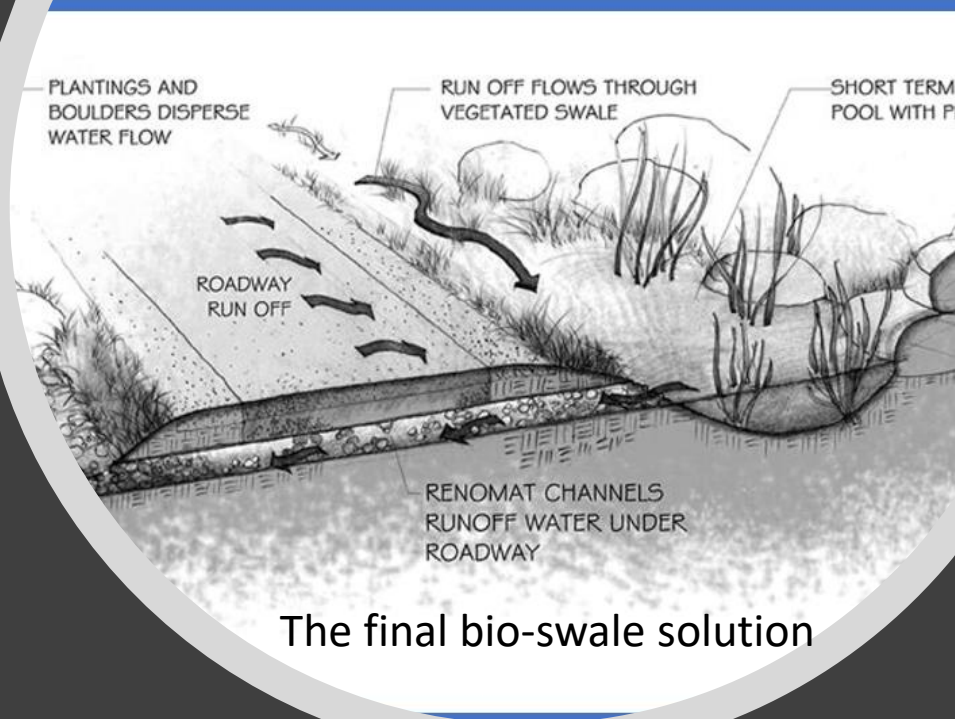
"Building Less-or not at all- is generally the most environmentally responsible choice."

Aligning the Team

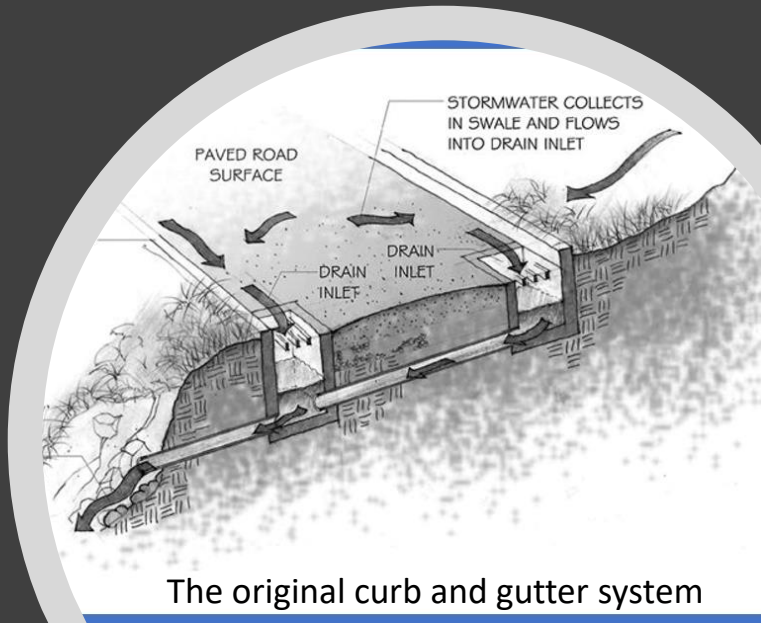
- Diversity of values, opinions, expectations, and perspectives.
- Diversity can be either an asset or a liability.
- An intentional process for helping clients and team members understand how and why the design process must be employed differently is critical.
- The story of teaching laboratory and operable windows:
  - Discussing the idea of indemnification (aligning values, aspirations, and objectives)
  - Addressing the problem of short-circuiting of the cooling system

Fostering an Iterative Process

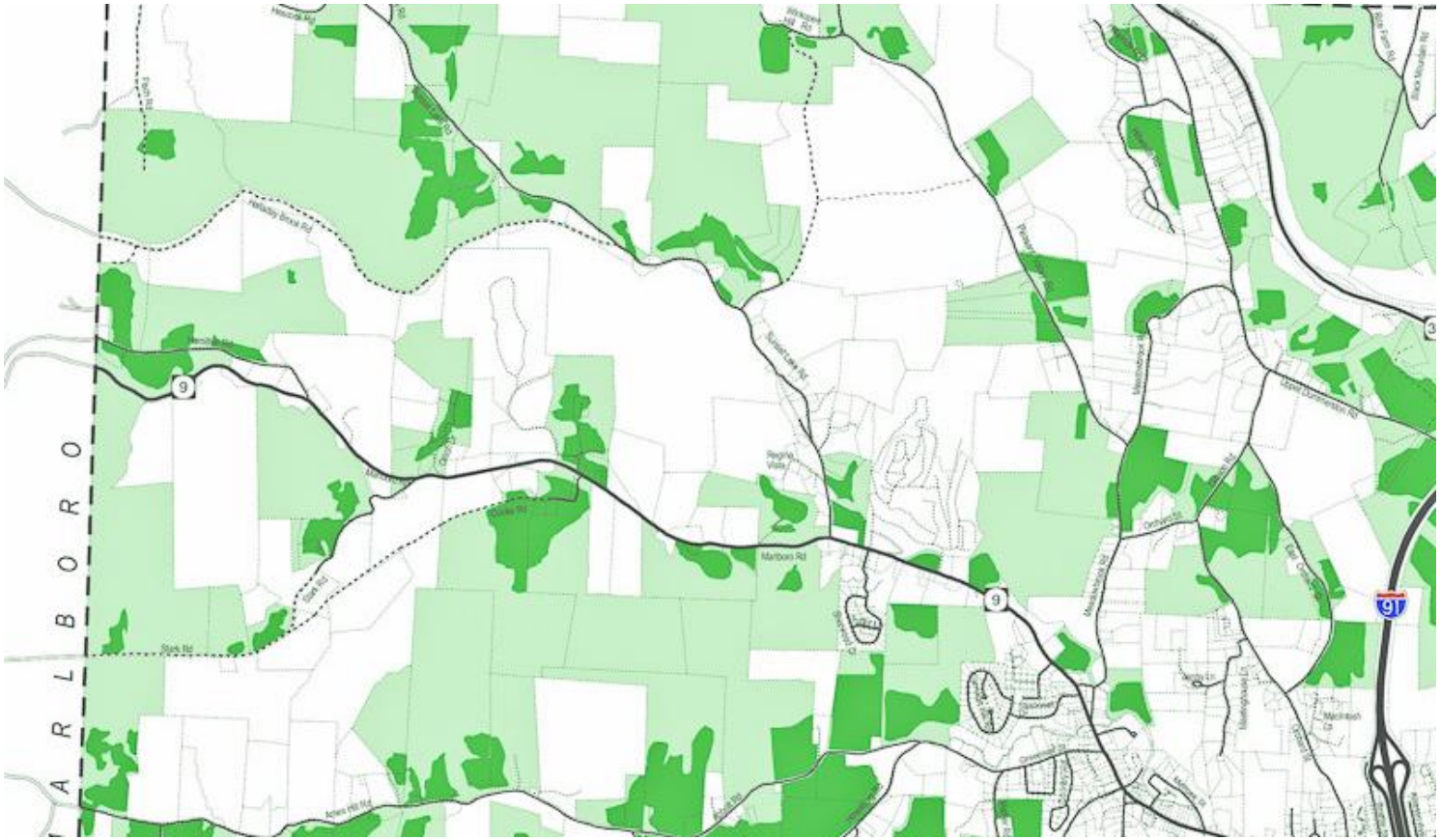
- Allows communication at every level
- Each team member's design decisions can be informed by an understanding of how their work relates to the whole.



The final bio-swale solution



The original curb and gutter system



Integrating Intentions with purpose: The Story of the Brattleboro Co-op Grocery Store

Looking at the more fundamental issues of sustainability before jumping into defining a building program.

⇒The question that aligned stakeholders: “What’s the project purpose?”

⇒Identified the changing dynamics that posed key threats to the future viability of the project.

⇒Grounded itself in a profound awareness of place and its vanishing food heritage, by promoting local farming.

⇒Included other local organizations to build a resilient business network, aligned around a shared regenerative vision of place.

⇒The purpose of the project shifted from simply building a grocery store to taking a key role in creating a sustainable community.

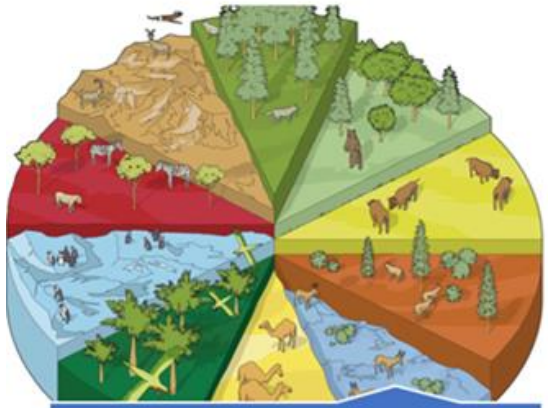
Integrating Intentions with purpose: The Story of the Brattleboro Co-op Grocery Store

The program of the building expanded to potentially include:

- an agricultural and soil extension service;
- a food canning operation for local produce;
- A credit union to support local agriculture and trading
- Sustainable agriculture education
- Mixed-income housing for employers
- A day-care center
- And an award winning highly energy efficient grocery store!

The Four Key Subsystems

- Each project has a distinct, purposeful contribution to make to the larger whole.
- All Developments are inherently linked and inextricably bound not only to larger nested systems but to primary subsystems within that whole.
- Looking through the lens of each can help us discover purposeful relationships between smaller and larger systems.



Habitat

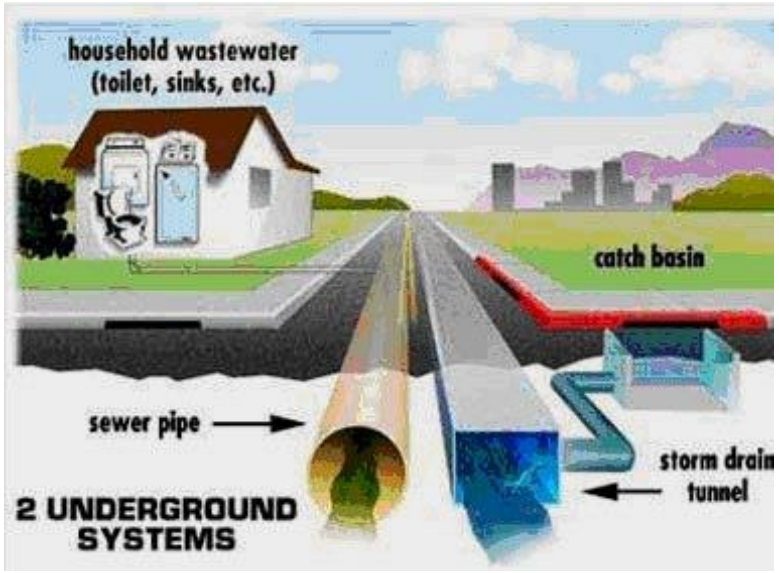
Water

Energy

Materials

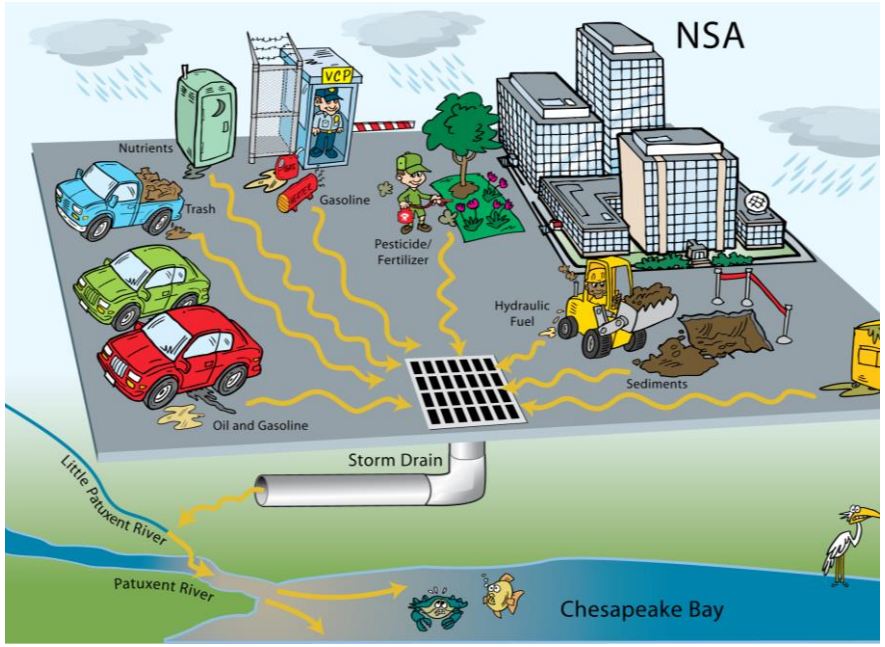
Water

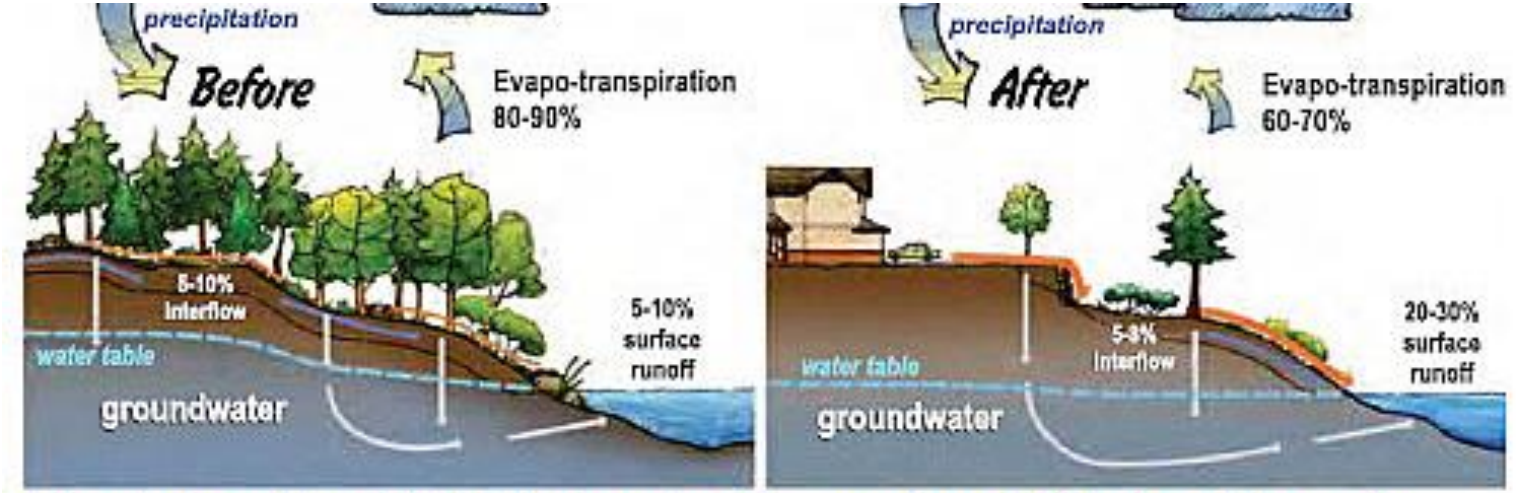
- In Massachusetts, at least two towns have built expensive, energy-intensive, and pollution-generating desalination plants in an effort to compensate for failing groundwater supply. Given the fact that Massachusetts receives an ample 40 inches of rain per year, why is this necessary?
- How does the earth get its ground water?
- Healthy soils generated by healthy habitat are required for healthy water.
- Our failure to design in harmony with the natural system has put us in a position where we are forced to implement new and expensive technologies to produce the clean water that the Earth produces all by itself.
- The burning of fossil fuels to generate the high levels of energy required to operate desalination plants produces pollutants and other toxicants, that in turn, contribute to phenomena like acid rain further polluting the Earth's primary source of fresh water.



Water- Materials systems

instead of utilizing natural bioswales and rain gardens to capture, store, and infiltrate rain water, we build complex and materials intensive stormwater conveyance systems to take water away- and the embodied energy to fabricate, install, and maintain them ties back to energy again.





Before development almost all rainfall is taken up by plants, evaporates or infiltrates through the ground.
After development, surface runoff increases significantly, carrying with it nutrients and contaminants.

Adapted imagery courtesy of the Puget Sound Partnership

Ecology of Water

Restoring a Cultural Relationship with the Land and water

- What do we mean when we say we want to restore the landscape, or restore the health of the earth?
- Regard a culture healthy so long as it continues to renew itself with each new generation.
- Much of our contemporary infrastructure and conventional planning methodologies are products of a contrived visual aesthetic with little understanding, relationship, or grounding in the unique realities of place.
- Once we understand the realities of place, there are infinite opportunities for creative expression; true design freedom is possible only within these limits.

Water- Principles

- Make the annual water budget equal to or less than annual rainfall on site.
- Use less water; reuse water when possible
- Retain all rainwater on site.

Potential Solutions:

- Integrating rainwater-harvesting systems into our building designs.
- Reducing impervious surface areas, installing a green roof, constructing a retention basin,…
- Constructing bioswales, raingardens, etc to clean the wastewater & recharge groundwater table

Habitat (human, Earth, and other biotic systems)

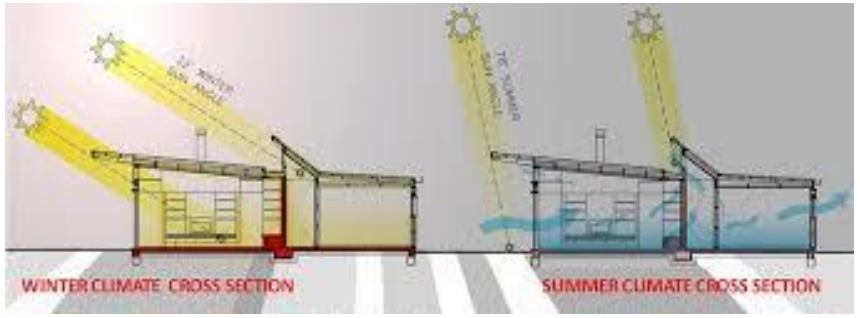
- We must take responsibility for developing in harmony with these other biotic systems in order to sustain life- all life.

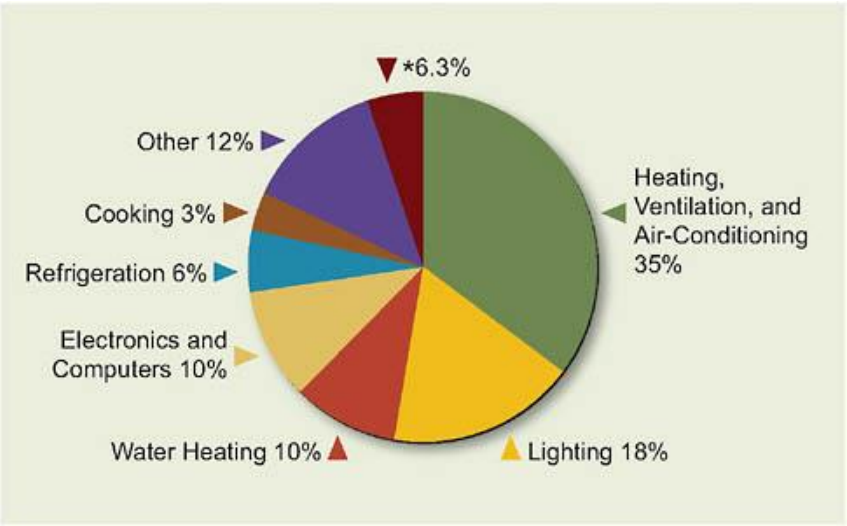
Principles:

1. Partner all human activities with living systems in mutually beneficial relationships- a project should contribute to supporting the systems of life on its site and within its watershed.
2. Understand and respect local ecological and social systems.
3. Build in essential feedback mechanisms to continuously evolve these relationships.

Energy- Principles

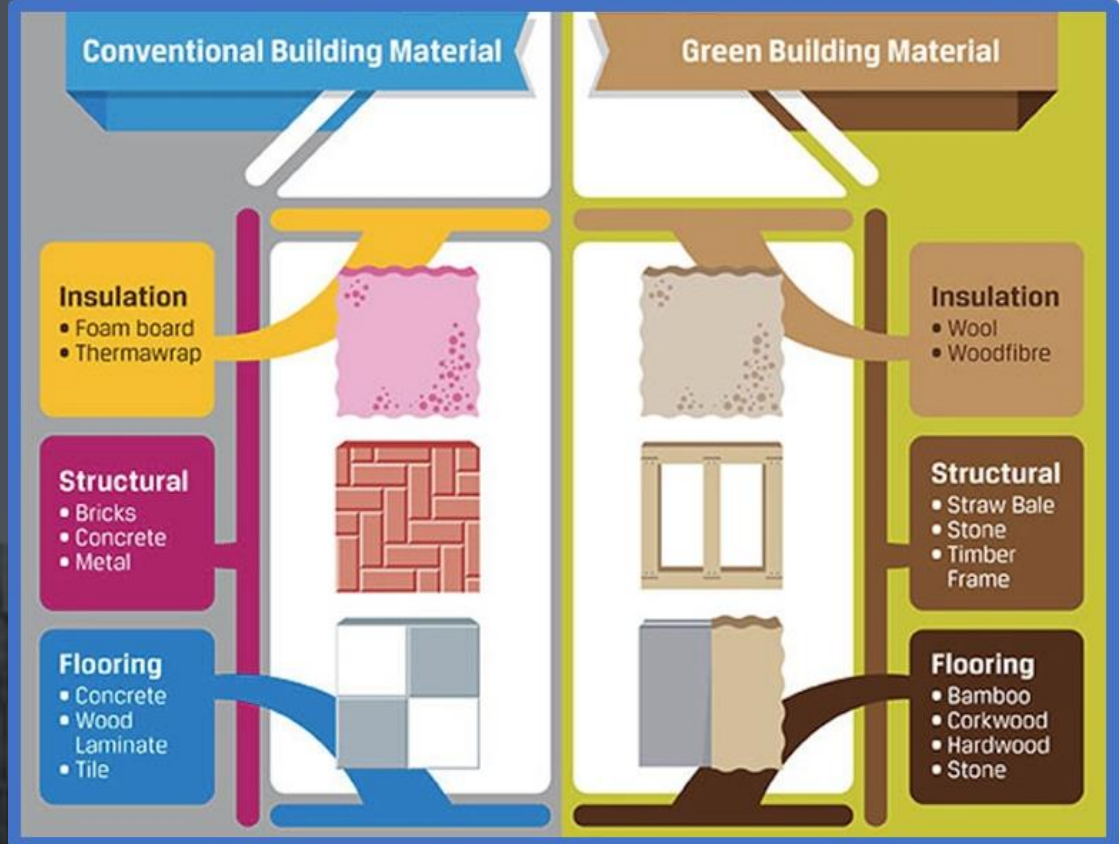
- Create less demand via use of insulation, demand patterns, reduced loads, etc.
- Use available site energies, and diurnal cycles.
- Increase the efficiency of what is left
- Minimize or neutralize carbon footprint.





Materials- Principles

- Use less- that which is not used has no environmental impact.
- Use materials that are abundant and renewable and that do not destroy human and/or earth systems in their extraction, manufacture, and disposal.
- Strive to use locally sourced, recyclable, nontoxic, and/or low-embodied-energy materials.



Sample Questions for writing your Reflections

با توجه به اینکه یکی از قدمهای اولیه در طراحی یکپارچه شناخت ماهیت مکان است، ماهیت مکان پروژه طرح معماری خود را چگونه تعریف می کنید؟ آیا می توانید در یک کلمه این ماهیت را نامگذاری کنید؟ چه نیروهایی می توانند در سیر تکاملی و یا تغییر این ماهیت در آینده تاثیرگذار باشند؟ فکر می کنید شناخت این ماهیت و نیروهای موثر برآن چه تاثیراتی می تواند احیانا در برنامه فیزیکی طرح، و شکل گیری طراحی شما داشته باشد؟

با توجه به اینکه یکی دیگر از تکنیکهای موفقیت در مرحله کشف و شناخت طراحی یکپارچه پرسیدن سوالات به جاست، برای شناخت بهتر ماهیت پروژه طرح معماری این ترم چه سوالاتی می توانید مطرح کنید ؟