

Module 4 Lesson 4 – Green Buildings

Saturday, October 15, 2022 8:32 PM

4.4.2 The Integrative Design Process (IDP)

- a highly collaborative & interactive **design process** that focuses on resource efficiency by employing systems thinking to derive multiple benefits from single expenditures
- consists of seven stages:
 - 1) Design & Preparation
 - 2) Evaluation
 - 3) Conceptual Design
 - 4) Schematic Diagram
 - 5) Design Development
 - 6) Construction Documents
 - 7) Bidding & Construction
- often added as the eighth stage:
 - 8) Occupancy, Operations, and Performance (Post-Occupancy)
- Integrated Buildings
 - "When a building takes more functions, that's a clue we're doing integrated design."

4.4.3 IDP Design Goals

- Key aspects of the IDP:
- Design Goals
 - Energy
 - energy use reduction, or better, energy generation (more energy generated for use elsewhere than the building uses)
 - Water
 - water use reduction (or even more water captured by the building for use elsewhere than used within the building)
 - Material
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- Site
 - optimal use of the building site
- Indoor Quality
 - optimal indoor quality for occupants (including air quality, sound quality, social environment, aesthetics, etc.)

2) People in the IDP

- Core Project Team Members
 - Client or owner's representative (i.e. with expertise in facilities & operations management)
 - project manager
 - architect
 - IDP facilitator
 - Champion (optional)
 - structural engineer
 - mechanical engineer
 - Simulation expert: energy modeling, thermal comfort analysis, and/or CFD simulations
 - energy analysis expert: an energy engineer &/or bioclimatic engineer may be required to cover certain areas of expertise such as passive solar design, renewable energy technologies, hybrid-tech strategies
 - electrical engineer
 - green design specialist
 - civil engineer with expertise in stormwater, groundwater, rainwater, and/or wastewater systems
 - facilities manager/building operator (maintenance & operations)
 - cost consultant (with experience in life-cycle costing)
 - landscape architect
 - general contractor or construction manager

- Additional Members

- > may be brought in by core team for duration of project or only a few workshops:
 - ecologist
 - occupants' or users' representatives
 - building program representative if appropriate for building type
 - planning/regulatory/code approval agencies representatives

existing program representative if appropriate for building type

- planning/regulatory/code approval agencies representatives
- interior designer/materials consultant
- lighting or daylighting specialist
- soils or geotechnical engineer
- Commissioning agent
- marketing expert
- Surveyor
- valuation/appraisal professional
- Controls specialist
- other experts as required
- Academics/students with knowledge of a relevant subject
- members of the community who are affected by the project

3) Design Charette

- an intensive planning session during which owners, designers & stakeholders collaborate to create an overarching vision for the project
- called when the project is particularly large

4.4.4 Leadership in Energy and Environmental Design (LEED)

• LEED v.4

- based on a credit system
- third-party certification system for design, construction, & operation of green buildings
- has seven impact categories:

1) Reverse Contribution to Global Climate Change

2) Enhance Individual Human Health and Well-being

3) Protect and Restore Water Resources

4) Protect, Enhance, and Restore Biodiversity & Ecosystem Services

5) Promote Sustainable & Regenerative Material Resources Cycles

6) Build a Greener Economy

7) Enhance Social Equity, Environmental Justice, and Community Quality of Life



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 - 1) BD+C Building Design & Construction
 - 2) ID+C Interior Design & Construction
 - 3) O+M Existing Buildings: Operations & Maintenance
 - 4) ND Neighborhood Development
 - 5) Homes Homes

- biggest difference of LEED v.4: Integrative Process (no categories, stand-alone)

- involves analysis of energy & water systems to inform design
- requires evaluation of opportunities early in design phase
- reviews cost effective options from all angles

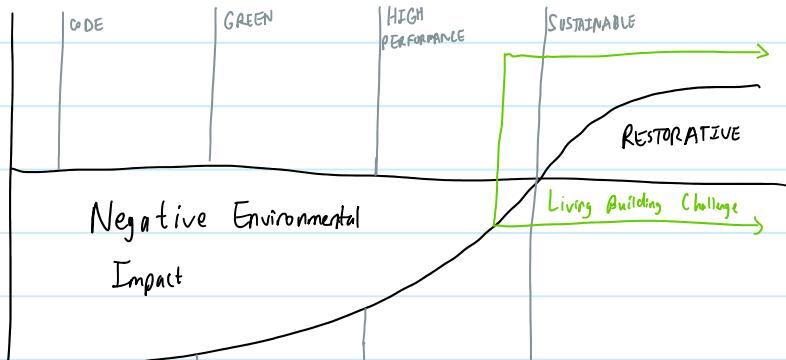
- other changes:

- BD+C → new credit category: Location & Transportation
- Materials & Resources
 - Focused on Life-Cycle Thinking
 - Product Transparency is a key component
 - Environmental Product Declaration (EPD)
 - Health Product Declaration (HPD)
- Water Efficiency
- Energy & Atmosphere
- Indoor Environmental Quality

4.4.5 Living Building Challenge (LBC)

- Certification only after building still performs as intended after one full year of people actually using the building
- Seven criteria (imperative): (7 petals, 20 imperatives)

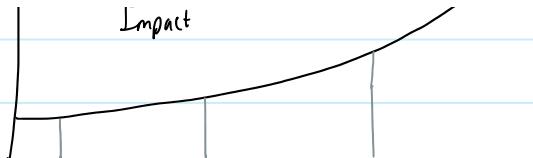
- 1) Site Integrity
- 2) Zero Net Water
- 3) Zero Net Energy
- 4) Health
- 5) Materials
- 6) Equity



7) Materials

6) Equity

7) Beauty



4.4.6 The Bullitt Building (Seattle)

- 1st 6-story building in the world to be truly energy-neutral from sunbeams hitting its own roof
- 1st large commercial structure to meet the Living Building Challenge

