Qatar Society of Engineers

LEED vs. GSAS Certification & Sustainability in FIDIC

Green Engineering Conference and Exhibition

By:

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What is Green Building

- The buildings in which we live, work, and play protect us from nature's extremes, yet they also affect our health and environment in countless ways.
- As the environmental impact of buildings becomes more apparent, the field called "green building" is developed gaining momentum.
- Green, or sustainable, building is the practice of creating and using:
  - healthier and more resource-efficient models
  - of construction, renovation, operation, maintenance and demolition

What is Green Building

- **Green building** refers to both:
  - 1- a structure, and
  - 2- the application of processes

  that are environmentally responsible and resource-efficient throughout a building's life-cycle:
  - from planning to design, construction, operation, maintenance, renovation, and demolition.
  - This requires close cooperation of the contractor, the architects, the engineers, and the client at all project stages.
  - The Green Building practice expands and complements the classical building design concerns of economy, utility, durability, and comfort

Impacts of the Built Environment

- **Aspects of Built Environment:**
  - Siting
  - Design
  - Construction
  - Operation
  - Maintenance
  - Renovation
  - Deconstruction

Impacts of the Built Environment

- **Consumption:**
  - Energy
  - Water
  - Materials
  - Natural Resources

Impacts of the Built Environment

- **Environmental Effects:**
  - Waste
  - Air pollution
  - Water pollution
  - Indoor pollution
  - Heat islands
  - Storm-water runoff
  - Noise

Impacts of the Built Environment

- **Ultimate Effects :**
  - Harm to Human Health
  - Environment Degradation
  - Loss of Resources

Impacts of the Built Environment

- Green buildings are designed to reduce the overall impact of the built environment on human health and the natural environment by:
  - Efficiently using energy, water, and other resources
  - Protecting occupant health and improving employee productivity
  - Reducing waste, pollution and environmental degradation

Impacts of the Built Environment

- Components of Green Buildings:
  - 1- Energy Efficiency and Renewable Energy;
  - 2- Water Efficiency;
  - 3- Environmentally Preferable Building Materials mad Specifications;
  - 4- Waste Reduction;
  - 5- Toxics Reduction;
  - 6- Indoor Air Quality;
  - 7- Smart growth and Sustainable development.

Impacts of the Built Environment

- Buildings Types:
  - 1- Homes;
  - 2- Schools;
  - 3- Commercial Building;
  - 4- Laboratories;
  - 5- Healthcare Facilities.

Impacts of the Built Environment

- As examples:
  - Green buildings may incorporate sustainable materials in their construction (e.g., reused, recycled-content, or made from renewable resources);
  - create healthy indoor environments with minimal pollutants (e.g., reduced product emissions); and/or
  - feature landscaping that reduces water usage (e.g., by using native plants that survive without extra watering).

Sustainable building rating systems

- The main Sub-Categories under Sustainable Engineering, Design and Architecture are (Alphabetical Order):
  - BREEM: (Building Research Establishment Environmental Assessment Method), first published by the (BRE) in 1990, based in Watford, England, UK.
  - CASBEE: (Comprehensive Assessment System for Built Environment Efficiency) is the green building management system in Japan.
  - EcoHomes: was an environmental rating scheme for homes in the UK.

Sustainable building rating systems

- The main Sub-Categories (Cont'd):
  - GSAS: [Originally QSAS is a green building certification system developed for the GCC countries. This system was announced after QSAS [Qatar sustainability assessment system] got acceptance from many of the GCC countries. Hence, the local system of QSAS was expanded to a regional scale and renamed into GSAS. (Qatar)
  - Green Star: is a voluntary sustainability rating system for buildings in Australia. It was launched in 2003 by the Green Building of Australia.

Sustainable building rating systems

- The main Sub-Categories (Cont'd):
  - The Haute Qualité Environnementale or HQE: (High Quality Environmental standard) is a standard for green building in France, based on the principles of sustainable development first set out at the 1992 Earth Summit.
  - Leadership in Energy and Environmental Design (LEED) is one of the most popular green building certification programs used worldwide, Developed by the non-profit U.S. Green Building Council (USGBC). U.S.

GSAS – Global Sustainability Assessment System

- GSAS is a green building certification system developed for the GCC countries
- the system was first known as QSAS [*Qatar sustainability assessment system*].
- Hence, the local system of QSAS was expanded to a regional scale and renamed into GSAS.
- The system is also now known as the Global Sustainability Assessment System.

GSAS – Global Sustainability Assessment System

- GSAS was established in 2009 by the Gulf Organization for Research and Development (GORD).
- GSAS TECHNICAL GUIDE 2017 - ISSUE 2.1 was released in 2017.
- GSAS is divided into 8 sustainability fields – categories.
- GSAS scoring is quantifiable on the scale of -1 to 3 (-1, 0, 1, 2, 3), which represents an underlying uniform ordinal scale from negative level (-1) to optimal level (3)

GSAS – Global Sustainability Assessment System

GSAS Categories and Weights		
1	Energy (E)	24%
2	Water (W)	16%
3	Indoor Environment (IE)	16%
4	Cultural & Economics (CE)	13%
5	Site (S)	9%
6	Urban Connectivity (UC)	8%
7	Materials (M)	8%
8	Management & Operations (MO)	6%
		100%

GSAS – Global Sustainability Assessment System

Cumulative or Aggregated Score (X)	GSAS Star Rating (★)
$x \leq 0$	Certification Denied
$0.00 < x \leq 0.50$	★
$0.50 < x \leq 1.00$	★★
$1.00 < x \leq 1.50$	★★★
$1.50 < x \leq 2.00$	★★★★
$2.00 < x \leq 2.50$	★★★★★
$2.50 < x \leq 3.00$	★★★★★★

Figure 18: GSAS Star Rating Table for Design & Build Certification

LEED - Leadership in Energy and Environmental Design

- LEED, or Leadership in Energy and Environmental Design, is the most widely used green building rating system in the world.
- LEED is available for virtually all building, community and home project types.
- LEED provides a framework to create healthy, highly efficient and cost-saving green buildings.

LEED - Leadership in Energy and Environmental Design

- LEED was developed by the non-profit U.S. Green Building Council (USGBC) and it includes a set of rating systems for the design, construction, operation, and maintenance of green buildings, homes, and neighborhoods.

- The Green Business Certification Inc. (GBCI) is the organization (US) that provides third-party credentialing and verification for several rating systems relating to built environment. It was established by the Green Building Certification Institute.
- LEED V4 was recently released in January 2018.

LEED - Leadership in Energy and Environmental Design

LEED is offered in 8 Categories		
	Description	Points
1	Innovstion and Design ID	11
2	Location and Linkages LL	10
3	Sustainable Sites	22
4	Water efficiency WE	15
5	Energy and Atmosphere EA	38
6	Materials and Resources MR	16
7	Indoor Air Quality IEQ	21
8	Awareness and Education AE	3
		136

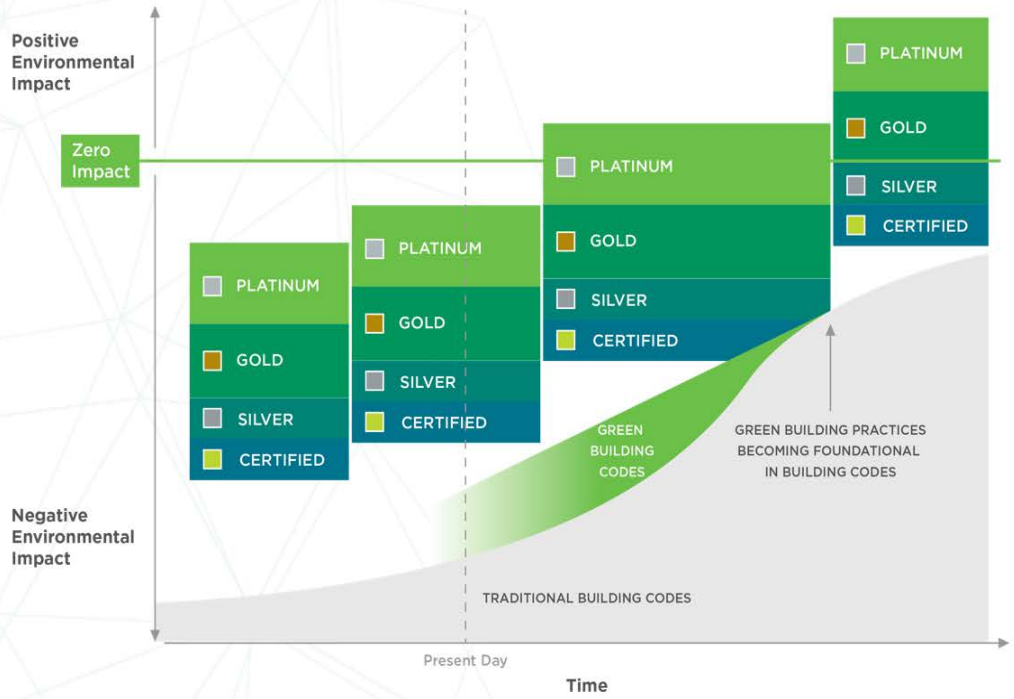
LEED - Leadership in Energy and Environmental Design

Certification Levels

40-49	50-59	60-79	80+
LEED Certified	LEED Silver	LEED Gold	LEED Platinum

Energy and Carbon Emissions

Improved Environmental Outcomes



CaGBC Green Building Toolkit: A Guide to Sustainable Communities | National v.1

CaGBC.org | 10

FIDIC and Sustainability in Projects

- FIDIC, the International Federation of Consulting Engineers had issued 13 books and reports on sustainability, some of them are:
  - Improving the Quality of Construction (2004),
  - Project Sustainability Management: Guidelines (2004)
  - State of the World Report 2012: Sustainable Infrastructure

FIDIC and Sustainability in Projects

FIDIC Professional Polices related to Sustainability

- FIDIC has 9 main policies related to sustainability in projects:
  - To promote international guidelines on ethics and the concept of sustainable development.
  - To promote at the various levels FIDIC's strategy for sustainable development in services supplied to government, local authorities, clients, and other decision-makers.
  - To ensure that sustainable development is a continual focus for national bodies in industry, commerce and infrastructure development.

FIDIC and Sustainability in Projects

FIDIC Professional Polices related to Sustainability

- Policies (Cont'd)
  - To redefine the role of the consulting engineering industry and promote the industry's skills to private and public bodies that influence infrastructure development and the economy at large.
  - To liaise with and support other international organisations that subscribe to the common goal of sustainable development.
  - To promote co-operation with financial institutions, with sectorial and business organisations, and with international organisations, notably those responsible for social welfare

FIDIC and Sustainability in Projects

FIDIC Professional Polices related to Sustainability

- Policies (Cont'd)
  - To aim to achieve demonstrable progress in reducing energy demand and greenhouse gas emissions by supporting the instruments and commitments of international conventions and protocols on climate change.
  - To support Member Associations and member firms in adopting sustainability, encouraging them to take up FIDIC's goals.
  - To advance technical development and high standards of qualifications, performance and cooperation in the industry so as to achieve a more sustainable outcome.

LEED vs. GSAS Certification & Sustainability in FIDIC

THANK YOU

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