To what sustainable design standard(s) do your projects typically adhere?

Leadership in Energy and Environmental Design (LEED) http://www.green.ca.gov/GreenBuildings/leed.htm

The LEED Green Building Rating SystemTM designed by the U.S. Green Building Council advances energy and material efficiency and sustainability for New Construction (LEED-NC) and for Existing Buildings (LEED-EB).

The Leadership in Energy and Environmental Design (LEED) Green Building Rating System, developed by the <u>U.S. Green Building Council</u> (USGBC), provides a suite of standards for environmentally sustainable construction. Since its inception in 1998, LEED has grown to encompass over 6,000 projects in 28 countries covering 1 billion square feet of development area. The hallmark of LEED is that it is an open and transparent process where the technical criteria proposed by the LEED committees are publicly reviewed for approval by the more than 8,500 membership organizations that currently comprise the USGBC.

Building Research Establishment's Environmental Assessment Method (BREEAM) - <u>http://www.breeam.org/page.jsp?id=66</u>

The BREEAM family of assessment methods and tools are all designed to help construction professionals understand and mitigate the environmental impacts of the developments they design and build.

Comprehensive Assessment System for Building Environmental Efficiency (CASBEE) World Green Building Council (WGBC) http://www.ibec.or.jp/CASBEE/english/index.htm

Promoting sustainability is a major social challenge.

As the building industry consumes large amounts of material resources and energy, specific technological and political means should be developed in order to promote sustainable buildings.

To be nationally authorized in Japan, a cooperative academic, industrial and governmental project has been to establish a new system called the Comprehensive Assessment System for Building Environmental Efficiency (CASBEE).

As the trend towards sustainable buildings became widespread in the 1980s and 1990s, many environmental assessment systems for buildings have captured considerable attention worldwide.

These assessment systems include BREEAM(Building Research Establishment Environmental Assessment Method), LEED (Leadership in Energy and Environment Design), and GB (Green Building) Tool etc.

These systems were developed to promote sustainable building through the market mechanism.

Along with disclosure of the assessment result, implementation of environmental assessments focusing on sustainability of buildings is needed to promote incentives for building owners, designers and users to develop high-quality sustainable buildings.

From this point of view, CASBEE is intended for implementation of the environmental assessment based on new concepts including BEE (Building Environmental Efficiency).

Energy Passport http://www.eere.energy.gov/buildings/tools_directory/softw are.cfm/ID=253/pagename=alpha_list

Correlation-based evaluation tool that enables heating needs in residential buildings to be assessed. It has been developed in the framework of the PASSYS project of the European Commission DG XII. The PASSPORT tool has close links to a preliminary European Standard for calculating energy requirements for heating in



residential buildings, because the PASSYS project and a working group of the European Standardisation Committee (CEN TC 89 WG4), having similar concerns, have worked in close collaboration. A choice is offered to the user of PASSPORT: either to follow strictly the CEN Standard or to call upon some features, intended to improve the accuracy of the results (especially in the case of passive solar buildings), but not retained by CEN for implification reasons.

The method is based on a steady-state energy balance for the building zone, with an allowance for external temperature variations and a utilisation factor taking account of the dynamic effect of internal and solar gains. The main improvements in comparison with previous simplified methods are listed below. The gain utilisation factor is given as a function of the gain to load ratio (GLR) and an inertia parameter t (time constant of the building or of the zone). The method treats separately two phenomena associated with intermittent heating: decreased losses due to lower inside temperatures and reduction in of the utilised gains to take account of periods when the building is not heated. Two intermittency factors are obtained from formulae taking account of the heating pattern and the time constant of the building. To deal with multi-zone passive solar buildings, uniform temperature zones are defined; then the calculation method is applied to each zone. To take account of the interaction between the zones, an interactive procedure is used to solve the heat balance for all zones.

Green Building Evaluation Standard -

http://www.usgbc.org/DisplayPage.aspx?CMSPageID=76

This list contains links to Internet resource sites collected by USGBC staff and members to facilitate green building research. This list is not exhaustive and will remain a work in progress. The USGBC would like to express special thanks to <u>Elizabeth Cordero</u>, green design consultant, for her contributions to this directory.

Please note that the USGBC may not be held liable for the contents of the referenced Web sites nor the inclusion and/or omission of Web sites in this list.

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Categories

Associations and Non-Profit Organizations

American Indoor Air Quality Council

American Institute of Architecture Committee on the Environment (COTE)

American Solar Energy Society

Architects, Designers and Planners for Social Responsibility (ADPSR)

Better Bricks (productivity)

Boston Area Solar Energy Association

Boston Building Materials Co-op (BBMC)

Boston Building Materials Resource Center (BMRC)

Building Concerns

Business for Social Responsibility (BSR)

Canada Green Building Council

Climate Action Network (CAN)

Community Greenhouse Foundation

Congress for the New Urbanism

Construction Materials Recycling Association

Development Center for Appropriate Technology

Education Design Showcase

Ecological Design Institute (EDI)

Environmental Defense

Florida Green Building Coalition

Global Environmental Options (GEO)

Global Green USA

Green Building Alliance (Pittsburgh)

Green Building Council Australia

Green Building Council Korea

Green Building Information Council (GBIC), Canada

Green Round Table: Sustainable Architecture and Design

Green Pages (Canada)

Healthy House Institute (HHI)

Hong Kong Professional Green Building Council

Institute of Brownfield Professionals

Japan Green Building Council

Metropolitan Partnership for Energy

Mexico Green Building Council

National Association of State Energy Officials (NASEO)

National Environmental Trust

National Pollution Prevention Center for Higher Education (NPPC)

Natural Resources Defense Council

Natural Step (US)

New Urban Guild

North East Sustainble Energy Association- NESEA

NW Energy Efficiency Alliance

Second Nature

Society of Building Science Educators

Soil and Water Conservation Society (SWCS)

Solar Living Institute

Sustainable Buildings Industry Council (SBIC)

Sustainable Energy Coalition

Urban Ecology

Used Building Materials Association (UBMA)

Wisconsin Green Building Alliance (WGBA)

World Green Building Council

Codes and Standards

American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)

American Society for Testing and Materials (ASTM)

Building Codes Assistance Project

Center of Excellence for Sustainable Development - codes compilation

Development Center for Appropriate Technology - codes

<u>GreenSpec</u>

International Code Council

International Organization for Standardization

U.S. DOE BTS - Codes and Standards program

Materials, Guides and Certification

Advanced Buildings

Building Materials Resource Center

Building for Environmental and Economic Sustainability (BEES 2.0)

Certified Forest Products Council

Center for Resourceful Building Technology

CIWMB Recycled Content Product Database

Concrete Network

Construction Materials Recycling Association

EnCompass - Map of Recycled Content Buildings

Environmental Design + Construction magazine

Environmental Resource Guide - American Institute of Architects

Find Green

Forest World - Sustainable Forest Products Resource

Good to be Green

GreenGuard (interior products emissions testing)

Green Building Databases & Design Resources

Green Building Pages, Inc.

Greenroofs.com

<u>Green Sage</u>

Green Seal

GreenSpec, from Environmental Building News

NY Wa\$teMatch Materials Exchange: Building Materials Reuse Calculator

oikos - Green Building Source

Partnership for Advancing Technology in Housing

Sustainable Design Resource Guid

Sustainable Products Corporation

Used Building Materials Association (UBMA)

U.S. EPA Environmentally Preferable Purchasing

Product Certification and Testing

American Society for Testing and Materials (ASTM)

Certified Forest Products Council

Forest Stewardship Council (in U.S., with international links)

<u>GreenGuard</u>

Green Seal

Scientific Certification Systems

Case Studies

901 Cherry in San Bruno, California

Adam J. Lewis Center for Environmental Studies

AIA COTE 2001 Top Ten Green Projects

Audubon House: Building for an environmental future

Bachelor Enlistied Quarters, Great Lakes Naval Training Center

Barney-Davis Green Renovation - Denison University Beddington Zero Energy Development (BedZED) Better Bricks (productivity) Big Horn Home Improvement Center - Silverthorne, CO BRE Environmental Building at Garston **BTS House of Straw** Civano - Tucson, AZ CIWMB case studies C. K. Choi Building, Institute of Asian Research, University of British Columbia, Canada Cobb Hill Cohousing - Vermont Daylighting and Productivity Study by Heschong Mahone Group Desert House, Phoenix, Arizona Earth General Earthship Ecology House - evaluation report Ecovillage Energy & Environmental Building Association - success stories enCompass - map of recycled-content buildings GreenHOME Green Building Alliance - Pittsburgh case studies The Greening of the White House Innovative Design Inc. - daylighting in schools International Case Study compilation - Hong Kong University Architecture King County, WA - Sustainable Building program case studies MIT Building Technology - Sustainable Urban Housing in China NESEA - Northeast Green Building Awards NEXT 21 (Osaka Gas Experimental Housing) Northland College - McLean Environmental Living and Learning Center NREL High Performance Buildings Research Projects OIKOS case study compilation Pennsylvania Cable and Telecommunications Association Pennsylvania Cambria Office - Department of Environmental Protection

Pennsylvania's First Green Building: DEP's Southcentral Regional Office Building

Property2us article: High Rise Apartment Building in Battery Park City

Research Institute of Innovative Technology for the Earth (RITE) office

Rocky Mountain Institute - Green Development Case Studies

San Diego Environmental Services' Ridgehaven building

Smart Growth Network - eco-industrial parks and other case studies

Takenaka Corporation - Environmentally Responsible Projects

Takenaka Corporation - University buildings

Ten Shades of Green

Thoreau Center for Sustainability, San Francisco

UNEP International Environmental Center

The Universal Design Living Laboratory

U.S. DOE - CESD's Green Building Success Stories (compilation)

U.S. EPA - Leading by Example (EPA buildings)

Village Homes - a green-built community in Davis, CA

Vital Signs Case Studies

William McDonough + Partners Projects

Zion Canyon Visitor and Transportation Center, NREL

Campus Initiatives

Arizona State University

Ball State University

Blueprint for a Green Campus

Bowdoin College

Brown is Green

California Polytechnic State University

Carnegie Mellon University

Clemson University

Connecticut College

CSU, Monterey Bay - Greening of the Campus

Dartmouth College

Duke University

Emory University

Environmental Education and Campus Greening

FGCU Green Building Project

Community Design

Georgia Institute of Technology

Harvard Green Campus Issues

Lewis and Clark College

Massachusettes Institute of Technology

Michigan Technological University's Sustainable Futures Institute

Middlebury College – Guiding Principles

Northwestern University

Omaha Metropolitan Community College

Pitzer College

Pomona College

Princeton University

Santa Clara University

State University of New York (SUNY)

Sustainable Development on Campus [IISD]

Univerity at Buffalo - Green Office

University of California - Berkeley, Green Design/Sustainable Architecture

Information Sources

University of Cincinnati

University of Florida

University of Oregon

University of Michigan, Sustainable Architecture

University of South Carolina

University of Vermont - Building a Green Campus

University of Washington – Facility Design Information Manual

Commissioning and Post-Occupancy Evaluation

Portland Energy Conservation Inc. - Commissioning Resources

Post Occupancy Evaluation

Methodological Approach

Design and Simulation Tools

Building Design Advisor

Building Energy Simulation Tools

Energy Design Tools

Environmental Support Solutions

EQUER (France)

Green Building Advisor

Green Buildings [Center of Excellence for Sustainable Development]

Interactive Tools Survey [University of Weimar, Germany]

International Association for Impact Assessments (IAIA)

Introduction to OTTV and Simulation Tools

U.S. DOE Building Energy Software: Tools Directory

Whole Building Design Guide

Design Resources

Architectural Resource Collaborative (ARC)

Architecture and Building

Earthship Architecture

<u>EBN</u>

Environmental Resource Guide - American Institute of Architects

Environmental Sustainable Architecture

Field Guide to Sustainable Construction

Green Building Pages, Inc.

Green Building Primer

greendesign.net - Green Building Resource Center

Green Design Sustainable Architecture

The Hannover Principles

LISA (LCA in Sustainable Architecture)

Natural Ventilation - A strategy for sustainability [MIT]

Sustainable Architecture

Sustainable Architecture Building and Culture

Sustainable Architecture Resource

Sustainable Building Resource

Sustainable Building Sourcebook

Sustainable Design Resource Guide - Denver AIA COTE

Economics

Green Economics Website

Natural Capitalism

Energy

Alliance to Save Energy

Better Bricks (productivity)

Center for Renewable Energy & Sustainable Technology (CREST)

The Energy Foundation

Renewable Energy Policy Project

State Energy Offices (U.S.)

Sustainable Energy Coalition

U.S. DOE Energy Efficiency and Renewable Energy Network (EREN)

U.S. DOE and U.S. EPA -- Energy Star program

U.S. Department of Energy Library

U.S. Department of Energy - EnergyFiles

U.S. National Energy Policy

U.S. National Renewable Energy Laboratory

World Bank energy projects

Funding

Bridgemer: Funding and Investing in Green Buildings

Center of Excellence for Sustainable Development - funding sources

Funding Green Buildings

Kresge Foundation

State Energy Offices (U.S.)

Tax Incentives Assistance Project (TIAP)

Government Initiatives & Guidelines

National/International Government

Federal Energy Management Program - Greening Initiatives/Tools

Federal Greening Toolkit

Field Guide to Sustainable Construction

Greening Federal Facilities

National Renewable Energy Laboratory

OECD Project on Sustainable Buildings

U.S. Air Force Environmentally Responsible Facilities Guide

U.S. Air Force - Green Base of the Future

U.S. DOE Center of Excellence for Sustainable Development

U.S. DOE Energy Efficiency and Renewable Energy Network (EREN)

U.S. DOE and U.S. EPA -- Energy Star program

U.S. DOE High Performance Commercial Buildings: A Technology Roadmap

U.S. DOE Low Life-Cycle-Cost Air Conditioner Program

U.S. DOE Office of Building Technology, State and Community Programs

U.S. DOE Rebuild America - Schools and Commercial Buildings

U.S. EPA's Environmentally Preferable Purchasing (EPP)

U.S. GSA Sustainable Design and LEED

U.S. GSA - Great Lakes Region - Build Green

U.S. National Park Service - Guiding Principles of Sustainable Design

U.S. Naval Facilities Engineering Command - design policy

Whole Building Design Guide

State/Provincial Government

British Columbia Buildings Corporation-Green Buildings BC

California Integrated Waste Management Board - Green Building Program

California High Performance Schools (CHPS)

Florida Sustainable Communities and e-design

Maryland Green Building Program

Minnesota Sustainable Design Guide

New Jersey Clean Energy Program - design support incentive

New York State Energy Research & Development Authority (NYSERDA)

New York State Green Building Tax Incentive Initiative

Oregon Office of Energy

Oregon Housing and Community Services

Pennsylvania Buildings - Governor's Green Government Council

Local Government

Alameda County, CA, Waste Authority - Green Building programs

Arlington County, VA - Green Building Incentive

Austin, TX, Green Building Program

Battery Park City Authority, NYC - High-Rise Residential Green Guidelines

Boulder, Colorado - Green Points Program

Cambridge Sustainable City

Coconino County, Arizona - Sustainable Economic Development Initiative

Hennepin County, MN - Sustainable Design Guide and Rating System

ICMA - Green Building Goes Local (article)

Issaquah, WA - Sustainable Building

King County, WA - Green Building Program

Kitsap County, WA - Build a Better Kitsap

Los Angeles, CA - Green Building Guidelines

Miami-Dade County, FL - Green Coalition

New York City High Performance Building Guidelines

Oakland, CA - Green Building Resource Center

Philadelphia, PA – Schools: Save Energy Campaign

Portland, OR - Green Rated

Portland, OR - Office of Sustainable Development

San Francisco, CA - Green Building Program

<u>San Jose, CA - Green Building Program</u>

Santa Barbara, CA - Innovative Building Design initiative

Santa Monica Green Building Guidelines & Ordinances

Scottsdale, AZ, Green Building Program

Seattle City Light - Built Smart program

Seattle Sustainable Building

Triangle J Council of Governments - High Performance Building Guidelines

Washington, DC - Metropolitan DC Council of Governments

Life Cycle Analysis and Costing

Activity-Based Management

ATHENA Sustainable Materials Institute

BEES (Building for Environmental and Economic Sustainability) [NIST]

BuildingGreen.com

Buildings and Life-Cycle Costing [Canadian Building Digest]

<u>Carnegie Mellon – Green Design Initiative (GDI)</u>

Comparing the Environmental Effects of Building Systems [Canadian Wood Council]

Eco-Quantum (Netherlands)

ENVEST (environmental impact estimating design software) [UK BRE]

LCAid (Australia)

Life Cycle Analysis for Residential Buildings [Canadian Wood Council]

Life Cycle Costing and Stainless Steel - ASSDA

LISA (LCA in Sustainable Architecture)

Media

Colorado Green Business

Environmental Building News

Environmental Design + Construction Magazine

Environmental News Network

<u>HGTV</u>

http://www.greenatworkmag.com/

Rating Systems

Alameda County, CA, Multifamily Green Building Guidelines

Austin, Texas, Green Building Program

Bepac – British Columbia

<u> Breeam – UK</u>

Breeam Office 1998 – Canada

British Columbia University – Facilities Branch Environmental Guidelines

Built Green Colorado

EarthCraft HouseTM

Scottsdale, Arizona, Green Building Program

U.S. Green Building Council – LEEDTM

Research Centers

Carnegie Mellon University Center for Building Performance and Diagnostics

Center for Energy Efficiency & Renewable Technologies (CEERT)

Center of Excellence for Sustainable Development (CESD), USDOE

Center for Maximum Potential Building Systems (CMPBS)

Center for Resourceful Building Technology (CRBT)

Center for Sustainable Systems - Environmental Energy Technologies Division

Centre for Sustainable Design

FICUS-Florida Internet Center for Understanding Sustainability

Green Resource Center, Berkeley

Hong Kong University - Building Energy Efficiency Research

Lawrence Berkeley National Laboratory-Building Technologies Dept.

Michigan Technological University's Sustainable Futures Institute

MIT Building Technology Group

National Renewable Energy Laboratory

Oak Ridge National Laboratory-Buildings Technology Center

Pacific Energy Center

Renewable Resource Data Center

Rocky Mountain Institute (RMI)

Sandia National Laboratories Renewable Energy Office

Simulation Research Group

Sustainability Research Profiles [Second Nature]

The Vital Signs Project

Sustainability/Miscellaneous

Agenda 21

Agenda 21 and other UNCED agreements

Agenda 21 and Sustainable Development

Agenda 21 - National Information

Ecosystem

Complexity and Connectivity in Ecosystems

Ecosystem Valuation

Revisiting Carrying Capacity: Area-Based Indicators of Sustainability

What is an Ecological Footprint?

Sustainability

Applying Sustainable Development

Center for Renewable Energy and Sustainable Technology

Consulting the Public Interest

Ecosustainable - Sustainable Environment

Environment & Sustainable Living

The Florida Center for Understanding Sustainability

Global Warming Articles

Indicators of Sustainability Training Course

Institute of Energy and Sustainable Design

Interagency Working Group on Sustainable Development Indicators

Intergovernmental Panel on Climate Change (IPCC)

National Centre for Sustainability (NCFS)

Organisation for Economic Co-Operation and Development

President's Council on Sustainable Development (U.S.) - publications

Sources of Sustainability

Sustainable Development Gateway

Sustainable Energy Authority of Victoria, Australia

Sustainable Measures

Sustainable USA

The Natural Step

The Sustainability Report

Towards Sustainability

United Nations Environment Programme

United Nations Sustainable Development Programme

U.S. House of Representatives' Livable Community Task Force

U.S. House of Representatives' Sustainable Development Caucus

World Bank

Wuppertal Institute for Climate, Environment and Energy

Urban Sustainability

Congress for the New Urbanism

European Union's Database on Good Practice in Urban Management and Sustainability

Florida Internet Center for Understanding Sustainability (FICUS)

<u>Global Development Research Center - Virtual Library on Urban</u> <u>Environmental Management</u>

Green Communities Assistance Kit

Livable Communities

<u>New Urbanism</u>

Smart Growth Network

SURBAN (database on sustainable urban development in Europe)

Sustainable Communities Resource Package (SCRP)

Sustainable Urban Design and Climate

Urban Ecology Australia

Green Globes - http://www.thegbi.org/greenglobes/history.asp

The Green Globes™ system

It's like having a 24-hour sustainability design consultant online.

The Green Globes system is a revolutionary green management tool that includes an assessment protocol, rating system and guide for integrating environmentally friendly design into commercial buildings. Once complete, it also facilitates recognition of the project through third-party verification. It's an interactive, flexible and affordable approach to environmental design.

The Green Globes environmental assessment and rating system represents more than nine years of research and refinement by a wide range of prominent international organizations and experts.

The genesis of the system was the Building Research Establishment's Environmental Assessment Method (BREEAM), which was brought to Canada in 1996 in cooperation with ECD Energy and Environment. Pioneers of this project included Jiri Skopek, John Doggart and Roger Baldwin, who were the principal authors of the BREEAM Canada document.

Green Star - http://www.greenstarinc.org/

Green Star® is a non-profit organization that encourages businesses to practice waste reduction, energy conservation and pollution prevention. After meeting specific standards, organizations are eligible for the Green Star Award, for general waste reduction, or the Air Quality Award, for reduced air pollution.

The Green Star Award is the original award on which the Green Star program was based. It is given to businesses, organizations, schools, and agencies that demonstrate a strong environmental and business ethic by implementing the eight Green Star Standards. These Standards encourage waste reduction within several media, as well as education and outreach. Examples of Standards topics include recycling, waste prevention, improved purchasing, outreach to other organizations, education of employees, reduction of toxic materials, water conservation, and energy efficiency.

National Association of Home Builders (NAHB) -

http://www.nahb.org/

NAHB is a Washington, D.C.-based trade association whose mission is to enhance the climate for housing and the building industry. Chief among NAHB's goals is providing and expanding opportunities for all consumers to have safe, decent and affordable housing. As "the voice of America's housing industry," NAHB helps promote policies that will keep housing a national priority.

United Nations Environment Programme (UNEP) -

http://www.unep.ch/

To provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations.

The Energy Programme

Addresses the environmental consequences of energy production and use, such as global climate change and local air pollution. UNEP Enegy is concerned with renewable energy, energy efficiency, transport, energy finance, and policy issues.

World Green Building Council (WGBC)

Vision

The World Green Building Council (WorldGBC) will be the peak global not-forprofit organisation working to transform the property industry towards sustainability through its members - national Green Building Councils.

Mission

The WorldGBC provides a federation "union" of national Green Building Councils whose common goal is the sustainable transformation of the global property industry. The WorldGBC shall:

- establish common principals for Green Building Councils;
- serve as a global voice on behalf of Green Building councils;
- support and promote individual Green Building Councils;
- establish a clearing for "knowledge" transfer between Green Building Councils;
- encourage development of market based environmental rating systems;
- recognise global green building leadership.

Objectives

The longer term objectives of the WorldGBC is to:

- create a global market for green building through the creation of successful national Green Building Councils;
- be the peak global voice for global green building issues;
- represent no less than 60% of the global property industry through countries with Green Building Councils;
- have a dynamic web presence that serves as the preeminent portal for global green building news;
- have collaborative relationships with all other complimentary global organisations.

What is your familiarity with the following analysis software?

IES - VE Green Building Studio EnergyPlus Design Builder Archiphysik EQuestTas Tas TRACE TRNSYSCarmelsoft