

performance measurement protocols for commercial buildings

Performance Measurement Protocols for Commercial Buildings: Unlocking Efficiency and Sustainability

performance measurement protocols for commercial buildings are essential tools that help facility managers, building owners, and sustainability experts evaluate how well a commercial property is functioning. In today's world, where energy efficiency, cost reduction, and environmental impact are under constant scrutiny, having a clear and reliable method to assess building performance is more important than ever. These protocols provide a structured approach to gather, analyze, and interpret data on various facets of building operations, from energy consumption to indoor air quality, helping stakeholders make informed decisions to optimize the building's overall performance.

Understanding what these protocols entail, why they matter, and how to implement them effectively can transform the way commercial buildings operate, leading to smarter energy use, better occupant comfort, and reduced operational costs.

What Are Performance Measurement Protocols for Commercial Buildings?

Performance measurement protocols for commercial buildings are standardized frameworks or sets of guidelines designed to assess and track the operational efficiency of buildings. They typically cover aspects such as energy use, water consumption, HVAC system effectiveness, lighting efficiency, indoor environmental quality, and maintenance practices. By employing these protocols, building managers can obtain a comprehensive picture of how their buildings perform in real-life conditions, rather than relying solely on design specifications or theoretical models.

These protocols often integrate data from building automation systems (BAS), utility meters, and environmental sensors, allowing for continuous monitoring and trend analysis. With the rise of smart building technologies, these measurement systems have become even more sophisticated, providing real-time insights and predictive analytics that can preemptively address performance issues.

Key Benefits of Using Performance Measurement

Protocols

- **Energy Efficiency Optimization:** Identifying areas where energy is wasted and implementing corrective measures.
- **Cost Savings:** Reducing utility bills through targeted improvements.
- **Sustainability Goals:** Supporting green certifications like LEED or BREEAM by providing documented performance data.
- **Occupant Comfort:** Ensuring indoor air quality and temperature levels meet health and productivity standards.
- **Regulatory Compliance:** Meeting government mandates on energy use and emissions.

Common Performance Metrics in Commercial Building Protocols

A critical aspect of performance measurement protocols is the selection of relevant metrics that truly reflect building health and efficiency. Here are some of the most widely used indicators:

Energy Use Intensity (EUI)

EUI measures the energy consumed per square foot per year, typically expressed in kBtu/sqft/year. It provides a benchmark to compare buildings of different sizes and types and is invaluable for tracking energy improvements over time.

Water Usage Metrics

Water consumption is increasingly scrutinized in performance protocols. Metrics such as gallons per occupant per day or total water use intensity help identify leaks, inefficient fixtures, or opportunities for water recycling.

Indoor Environmental Quality (IEQ)

IEQ includes parameters like air quality, lighting levels, temperature, humidity, and noise. High IEQ scores correlate with healthier, more productive occupants.

Operational Cost Metrics

Tracking operational costs related to energy, water, and maintenance allows facility managers to understand the financial impact of inefficiencies and prioritize upgrades.

Implementing Performance Measurement Protocols Effectively

Successfully applying these protocols in commercial buildings requires a strategic approach that combines technology, data analysis, and human expertise.

Step 1: Establish Clear Objectives

Before jumping into data collection, define what you want to achieve. Are you aiming to reduce energy costs, improve occupant comfort, or comply with a specific green building certification? Clear goals will guide the choice of metrics and tools.

Step 2: Deploy the Right Tools and Technologies

Modern building management systems equipped with IoT sensors are the backbone of effective performance measurement. These systems can continuously monitor energy consumption, temperature, humidity, and more, feeding data into centralized dashboards for easy interpretation.

Step 3: Data Collection and Validation

It's crucial to ensure data accuracy and integrity. Regular calibration of sensors, validation of meter readings, and cross-checking with utility bills help maintain trustworthy datasets.

Step 4: Analyze and Interpret Data

Raw data alone isn't enough. Use analytics software and benchmarking tools to identify trends, anomalies, and areas for improvement. For example, a sudden spike in energy use might indicate equipment malfunction or operational changes.

Step 5: Take Action and Monitor Results

Implement energy-saving measures or maintenance interventions based on data insights. Continuously monitor the impact of these actions to verify improvements and adjust strategies as needed.

Popular Performance Measurement Protocols and Standards

Several established protocols and frameworks guide commercial building performance measurement, each with unique strengths and areas of focus.

ASHRAE Building Energy Quotient (bEQ)

Offered by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, the bEQ certification evaluates actual building energy performance and compares it against peers, providing a clear energy rating.

International Performance Measurement and Verification Protocol (IPMVP)

IPMVP is a widely recognized framework for quantifying energy savings in retrofit projects. It provides standardized methods for measurement and verification to ensure transparent reporting.

LEED Performance Score

The Leadership in Energy and Environmental Design (LEED) system incorporates performance measurement through its ongoing monitoring requirements, helping buildings maintain certified status over time.

Energy Star Portfolio Manager

This free online tool from the U.S. Environmental Protection Agency enables building owners to track energy and water consumption, benchmark against similar buildings, and identify efficiency opportunities.

Challenges in Measuring Commercial Building Performance

While performance measurement protocols are powerful, implementing them isn't without hurdles.

Data Overload and Complexity

Modern buildings generate vast amounts of data, which can overwhelm facility teams. Without proper tools and expertise, it's challenging to extract actionable insights.

Integration Issues

Legacy systems and diverse equipment brands can make data integration difficult, limiting the effectiveness of centralized monitoring.

Cost Constraints

Installing advanced monitoring systems and maintaining them can require significant upfront investment, which may deter some property owners.

Changing Building Use Patterns

Variability in occupancy and operational hours complicates performance assessments, necessitating dynamic baseline adjustments and flexible protocols.

Tips for Maximizing the Value of Performance Measurement Protocols

- **Engage Stakeholders Early:** Involve facility teams, tenants, and management in goal-setting and data review to ensure buy-in.
- **Leverage Automation:** Use automated reporting and alert systems to quickly identify and respond to issues.
- **Benchmark Regularly:** Compare performance against industry standards or similar buildings to gauge success.
- **Invest in Training:** Equip staff with the knowledge to interpret data and implement improvements effectively.

- ****Prioritize High-Impact Areas:**** Focus on major energy-consuming systems like HVAC and lighting for the greatest returns.

Performance measurement protocols for commercial buildings are more than just technical tools—they are vital instruments for driving continuous improvement. When applied thoughtfully, they empower building owners and operators to create spaces that are not only cost-effective and environmentally responsible but also comfortable and productive for occupants. As technology evolves and sustainability demands increase, these protocols will continue to play a central role in shaping the future of commercial real estate management.

Frequently Asked Questions

What are performance measurement protocols for commercial buildings?

Performance measurement protocols for commercial buildings are standardized methods and procedures used to assess and quantify various aspects of a building's operational efficiency, energy consumption, indoor environmental quality, and overall sustainability.

Why are performance measurement protocols important for commercial buildings?

They help building owners and facility managers identify inefficiencies, optimize energy use, improve occupant comfort, ensure regulatory compliance, and support sustainability goals, ultimately reducing operating costs and environmental impact.

Which standards are commonly used as performance measurement protocols in commercial buildings?

Common standards include ASHRAE Guideline 14 for energy measurement, the International Performance Measurement and Verification Protocol (IPMVP), LEED performance criteria, and ENERGY STAR Portfolio Manager metrics.

How does the International Performance Measurement and Verification Protocol (IPMVP) apply to commercial buildings?

IPMVP provides a framework for quantifying energy and water savings in buildings by defining measurement boundaries, selecting appropriate measurement methods, and ensuring accurate and consistent verification of performance improvements.

What key performance indicators (KPIs) are typically measured in commercial building performance protocols?

Typical KPIs include energy use intensity (EUI), water usage, indoor air quality parameters, thermal comfort, equipment efficiency, and carbon emissions associated with building operations.

How can technology assist in implementing performance measurement protocols in commercial buildings?

Advanced metering infrastructure, building automation systems, IoT sensors, and data analytics platforms enable real-time monitoring, data collection, and analysis, facilitating accurate performance measurement and timely decision-making.

What challenges exist in applying performance measurement protocols to commercial buildings?

Challenges include data accuracy and consistency, integrating diverse building systems, accounting for occupancy and weather variability, upfront costs of monitoring equipment, and ensuring staff are trained to interpret and act on the data.

Additional Resources

Performance Measurement Protocols for Commercial Buildings: A Comprehensive Review

performance measurement protocols for commercial buildings have become an essential framework for assessing and enhancing building performance in today's sustainability-driven real estate landscape. As businesses and facility managers increasingly prioritize energy efficiency, occupant comfort, and operational cost reduction, adopting standardized protocols for performance measurement is no longer optional but imperative. These protocols enable stakeholders to quantify building performance reliably, identify inefficiencies, and benchmark against industry standards or peer buildings.

This article delves into the intricacies of performance measurement protocols tailored for commercial buildings, exploring their methodologies, benefits, and challenges. Drawing on current industry practices, regulatory requirements, and emerging technologies, the discussion offers a comprehensive perspective on how these protocols drive smarter building management and sustainable operations.

Understanding Performance Measurement Protocols for Commercial Buildings

Performance measurement protocols for commercial buildings are structured methodologies designed to evaluate various aspects of building operation. These aspects typically include energy consumption, indoor environmental quality, water usage, and occupant satisfaction. The protocols provide a systematic approach to data collection, analysis, and reporting, ensuring that performance metrics are accurate, comparable, and actionable.

At their core, these protocols serve multiple purposes:

- **Benchmarking:** Comparing building performance against industry standards or similar facilities.
- **Optimization:** Identifying areas for operational improvement and energy savings.
- **Compliance:** Meeting local, national, or international regulatory requirements.
- **Certification:** Supporting sustainability certifications such as LEED, BREEAM, or WELL.

The implementation of a performance measurement protocol typically involves baseline data establishment, ongoing monitoring, and periodic reporting. The choice of protocol often depends on the building type, geographic location, and the specific goals of the property owner or manager.

Key Protocols and Standards in the Industry

Several established protocols and standards dominate the field of commercial building performance measurement:

1. **ASHRAE Guideline 14:** Focused on energy measurement and verification, it offers methods to quantify savings from energy conservation projects.
2. **International Performance Measurement and Verification Protocol (IPMVP):** A widely recognized framework for verifying energy savings.
3. **Building Energy Quotient (bEQ):** Developed by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), this rating system evaluates energy use and operational practices.

4. **Energy Star Portfolio Manager:** An EPA-backed tool for tracking energy and water consumption across portfolios, facilitating benchmarking and reporting.

Each protocol emphasizes different performance dimensions, but all require rigorous data collection and validation processes to ensure reliability.

Components of Effective Performance Measurement Protocols

To achieve comprehensive performance evaluation, protocols must incorporate several critical components:

Data Collection and Monitoring

Accurate and timely data collection forms the backbone of any performance measurement system. Commercial buildings typically rely on Building Management Systems (BMS), sub-metering, and IoT sensors to gather real-time data on energy use, HVAC performance, lighting, and occupancy patterns. The granularity of data—ranging from whole-building energy consumption to equipment-level metrics—affects the precision of analyses and subsequent decision-making.

Normalization and Benchmarking

Raw data alone can be misleading due to variabilities such as weather conditions, occupancy rates, and operational schedules. Performance measurement protocols incorporate normalization techniques to adjust for these factors, enabling fair comparisons over time or between buildings. Benchmarking then positions a building's performance relative to peers or established standards, highlighting areas needing improvement.

Verification and Validation

Ensuring that reported performance accurately reflects reality is critical, especially when tied to financial incentives or regulatory compliance. Protocols often prescribe independent verification processes, which may include on-site inspections, data audits, or third-party reviews. Validation helps prevent discrepancies and builds confidence among stakeholders.

Reporting and Communication

Transparent and standardized reporting formats facilitate communication between building owners, operators, tenants, and regulators. Detailed reports may include key performance indicators (KPIs), trend analyses, and recommendations for corrective action. Digital dashboards and visualization tools increasingly enhance accessibility and engagement.

Challenges and Considerations in Protocol Implementation

Despite their benefits, performance measurement protocols for commercial buildings face several challenges that can impact their effectiveness.

Data Quality and Integration

One of the primary hurdles is ensuring data quality. Inconsistent sensor calibration, missing data points, or incompatible data formats can undermine the integrity of performance assessments. Additionally, integrating data from multiple systems—such as energy meters, HVAC controls, and occupancy sensors—requires sophisticated data management solutions and expertise.

Cost and Resource Allocation

Implementing comprehensive performance measurement protocols can be resource-intensive, especially for smaller commercial properties. Costs associated with advanced metering infrastructure, software platforms, and skilled personnel may deter adoption. Organizations must weigh these costs against anticipated energy savings and operational benefits.

Dynamic Occupancy and Usage Patterns

Commercial buildings often experience fluctuating occupancy and usage patterns due to tenant turnover, seasonal variations, or operational changes. These dynamics complicate the establishment of consistent baselines and may require adaptive measurement approaches to maintain accuracy.

Regulatory and Market Variability

Regulatory requirements and market expectations for building performance

measurement vary widely across jurisdictions. Navigating this complexity necessitates familiarity with local codes, certification programs, and incentive structures, which can evolve over time.

Emerging Trends and Technological Innovations

The landscape of performance measurement protocols continues to evolve, driven by advancements in technology and growing sustainability mandates.

Integration of Artificial Intelligence and Machine Learning

AI-powered analytics are increasingly being integrated into performance measurement systems to identify patterns, predict equipment failures, and optimize energy use in real-time. These intelligent systems enhance the depth and responsiveness of building performance assessments.

Enhanced Occupant-Centric Metrics

Beyond traditional energy and water metrics, protocols are beginning to incorporate occupant comfort, health, and productivity indicators. This holistic approach acknowledges that building performance is not solely about resource efficiency but also about creating supportive environments.

Cloud-Based Platforms and IoT Connectivity

Cloud computing and IoT technologies facilitate seamless data collection, storage, and analysis across multiple sites. These platforms support scalable performance measurement and allow for remote monitoring and control, increasing operational agility.

Alignment with Net-Zero and Resilience Goals

As commercial buildings aim for net-zero energy consumption and enhanced resilience to climate impacts, performance measurement protocols are adapting to include renewable energy integration, demand response capabilities, and resilience metrics.

Best Practices for Implementing Performance Measurement Protocols

For commercial building stakeholders seeking to adopt or refine performance measurement protocols, several best practices emerge from industry experience:

- **Establish Clear Objectives:** Define what performance aspects are most critical—energy savings, occupant comfort, regulatory compliance, etc.—to tailor the protocol accordingly.
- **Invest in Quality Data Infrastructure:** Deploy reliable sensors and metering equipment, and ensure robust data management systems are in place.
- **Engage Stakeholders:** Involve facility managers, tenants, and sustainability teams early to align expectations and foster collaboration.
- **Leverage Third-Party Expertise:** Utilize consultants or certification bodies to validate data and reporting.
- **Continuously Review and Update:** Regularly assess protocol effectiveness and update metrics or tools in response to technological and regulatory changes.

Implementing these strategies can maximize the value derived from performance measurement protocols and support continuous improvement in commercial building operations.

Performance measurement protocols for commercial buildings are pivotal in driving transparency, accountability, and sustainability within the built environment. As technologies advance and environmental imperatives intensify, these protocols will likely become more sophisticated and integral to commercial real estate management. Stakeholders who proactively embrace these frameworks will be better positioned to optimize building performance, reduce operational costs, and contribute to broader sustainability goals.

[Performance Measurement Protocols For Commercial Buildings](#)

performance measurement protocols for commercial buildings: [Performance Measurement Protocols for Commercial Buildings](#) , 2010 Provides three levels of standardized

protocols for assessing building performance that identify what, how, and how often to measure in six performance categories: energy, water, thermal comfort, indoor air quality, lighting, and acoustics. Such protocols give feedback when performance does not match design intent and lend credibility to performance claims--Provided by publisher.

performance measurement protocols for commercial buildings: Performance Measurement Protocols for Commercial Buildings, 2012 Performance Measurement Protocols for Commercial Buildings: Best Practices Guide is the how-to guide for continuously evaluating and improving the performance of commercial buildings throughout their service life. It is also intended to support integrated commissioning and all activities of the building's O and M team. It is the book that facility managers, building operators, technicians, consultants, commissioning authorities, architects, and design engineers need to ensure that their buildings are green, energy efficient, highly productive, healthy, and attractive to others. This Guide gives building owners and their consultants the practical performance measurement guidance to meet market demands for keeping operating costs down without sacrificing the health, comfort, and productivity of their highest cost component - the building's occupants. This book provides specific best practices in the areas of energy use, water use, and four elements of indoor environmental quality (IEQ): thermal comfort, indoor air quality (IAQ), lighting/ daylighting, and acoustics. Using this guidance, owners can be proactive on an ongoing basis to reduce costs through measurement and verification of their buildings' environments. This book is a follow-on publication to ASHRAE's Performance Measurement Protocols for Commercial Buildings, which describes what to measure, how it is to be measured, and how often it is to be measured to quantitatively assess the performance of commercial buildings. This Guide provides the process and tools for performance evaluation and improvement and is user friendly, phased, and readily applicable, with step-by-step procedures provided at three levels of application: Basic Evaluation, which uses observations of building characteristics, perceptions of occupants, and data from utility bills to characterize performance Diagnostic Measurement, which uses physical measurements to diagnose problems indicated at the Basic Evaluation Level and to identify how performance can be improved. Advanced Analysis, which uses the results of the first two levels plus the results of professional investigative processes to identify specific actions for performance improvement.

performance measurement protocols for commercial buildings: Methodology for Rating a Building's Overall Performance Based on the ASHRAE/CIBSE/USGBC Performance Measurement Protocols for Commercial Buildings Hyojin Kim, 2013 This study developed and applied a field test to evaluate the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)/Chartered Institute of Building Services Engineers (CIBSE)/United States Green Building Council (USGBC) Performance Measurement Protocols (PMP) for Commercial Buildings in a case-study office building in central Texas. As the first integrated protocol on building performance measurement, the ASHRAE PMP accomplished its goal of providing the standardized protocols for measuring and comparing the overall performance of a building, including energy, water, thermal comfort, Indoor Air Quality (IAQ), lighting, and acoustics. However, several areas for improvement were identified such as conflicting results from different procedures or benchmarks provided in the ASHRAE PMP; limited guidelines for performing the measurements; lack of detailed modeling techniques, graphical indices, and clear benchmarks; and some practical issues (i.e., high cost requirements and time-intensive procedures). All these observations are listed as the forty issues, including thirteen for energy, five for water, and twenty-two for Indoor Environmental Quality (IEQ). Recommendations were developed for each issue identified. For the selected high-priority issues, twelve new or modified approaches were proposed and then evaluated against the existing procedures in the ASHRAE PMP. Of these twelve new or modified approaches, the following are the most significant developments: a more accurate monthly energy use regression model including occupancy; a monthly water use regression model for a weather-normalized comparison of measured water performance; a method how to use a vertical temperature profile to evaluate room air circulation; a method how to use L_{Ceq} - L_{Aeq} difference as a low-cost alternative to estimate low

frequency noise annoyance; a statistical decomposition method of time-varying distribution of indices; and a real-time wireless IEQ monitoring system for the continuous IEQ measurements. The application of the forty recommendations and the twelve new or modified approaches developed in this study to the ASHRAE PMP is expected to improve the applicability of the ASHRAE PMP, which aligns the overall purpose of this study. Finally, this study developed a new single figure-of-merit rating system based on the ASHRAE PMP procedures. The developed rating system is expected to improve the usability of the protocols. The electronic version of this dissertation is accessible from <http://hdl.handle.net/1969.1/148375>

performance measurement protocols for commercial buildings: Assessing the Validity, Reliability, and Practicality of ASHRAE's Performance Measurement Protocol Gabrielle McMorro, 2017 In 2010, ASHRAE published Performance Measurement Protocols for Commercial Buildings, which defines a standardized method of measuring and analyzing building performance in six different categories, including energy, water, thermal comfort, indoor air quality, lighting, and acoustics. Each category within the PMP has three levels (basic, intermediate, and advanced) and with each category, depth of analysis and exploration into building performance increases. Tasks prescribed by the PMP were implemented in two diverse buildings located in Laramie, WY with the goal of testing and evaluating the current protocol. Based on experiences performing the protocol in this wide range of buildings, we assess the validity, reliability, and practicality of the current Performance Measurement Protocols (PMP). In the context of PMP analysis, validity is defined as the legitimacy of metrics and benchmarking criteria recommended by the PMP, reliability deals with the accuracy and repeatability of the measurement methods, and practicality concerns the cost, feasibility, and ease of measurement of the measurements required by the PMP. The study found that many tasks prescribed by the PMP are, in fact, valid, however, can be difficult to repeat within a variety of building types. Additionally, many intermediate- and advanced-level measurements/experiments require costly equipment and complex procedures that may not be feasible for implementation within all facilities. A summary of recommendations for inclusion in future editions of the PMP can be found in this document.

performance measurement protocols for commercial buildings: Data-Driven Research on Characteristics of Operating Performance of Green Office Buildings Yang Geng, 2025-09-26 This book facilitates more comprehensive understandings of operating performance of green buildings and provides technical supports for high-quality developments in building industry. In recent years, the development of green building is facing a transformation from “quantity” to “quality.” The acquisition of actual performance data (including energy consumption, IEQ, and occupant satisfaction) and its in-depth quantitative research are of great significance to comprehensively improve the quality of green buildings. However, there was a lack of high-quality, long-term and large-scale operating performance data of green buildings, which resulted in shallow and incomplete cognitions of performance characteristics and failures to guide building operation. In this thesis, the author carries out pioneering researches on data collection, characteristics cognition, performance diagnosis and optimization: (i) An intelligent IEQ monitoring and feedback system is developed for continuous data collection with a high spatial-temporal resolution. Based on that, 63 buildings from different climate zones in China have been measured and a database with more than 100 million records is established, including energy consumption, indoor air temperature, relative humidity, CO₂, PM_{2.5}, illumination and occupant satisfaction. (ii) Seasonal and regional distribution characteristics of IEQ in green office buildings are revealed, as well as its quantitative correlation with energy consumption. Both positive and negative effects of energy saving on thermal comfort are found and the negative effect is more significant in buildings with natural ventilation. (iii) A series of data-driven analysis and diagnosis models are proposed, such as the IEQ diagnosis method based on multi-dimensional dynamic field, the regression model between energy use and outdoor weather, the coupling approach of data mining models and physical functions for building performance diagnosis and optimization.

performance measurement protocols for commercial buildings: Building Performance

Evaluation Wolfgang F.E. Preiser, Andrea E. Hardy, Ulrich Schramm, 2017-08-30 The main aim of this book is to present an intriguing retrospective of Building Performance Evaluation (BPE) as it evolved from Post-Occupancy Evaluation (POE) over the past 25 years. On one hand, this is done by updating original authors' chapter content of Building Evaluation, the first edition published in 1989. That, in turn, is augmented by an orientation toward current and future practice on the other, including new authors who are engaged in ongoing, cutting edge projects. Therefore, individual, methodology oriented chapters covering the fundamental principles of POE and BPE go along with major thematic chapters, topics of which like sustainability or integration of new technologies are addressed in a diversity of case studies from around the globe. Research, methodologies, and framework of POEs continue to evolve. POEs are one step, on the larger scale of BPE, in understanding how buildings function after they are occupied. This resource helps architects, building owners, and facility managers understand the implications and reactions to the facilities that they designed, built and/or commissioned. By considering the whole process from conception to future uses of the building, there can be a more holistic approach to the planning, programming, design, construction, occupancy, and future adaptability of the structure. This book is dedicated to first editor Wolfgang F. E. Preiser who passed away during the process of editing and reviewing chapters of this volume.

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state-of-the-art approaches in the context of simulation-based design workflows, innovative technologies and real project case studies, all targeting low and net-zero energy solutions that enhance occupant comfort. Readers benefit from a comprehensive approach that improves the feedback loop between design intent and performance in use. The book is intended for architects, lighting designers, facade engineers, manufacturers and building owners/operators, as well as advanced students.

performance measurement protocols for commercial buildings: LEED v4 BD&C EXAM GUIDE Gang Chen, 2015-06-26 Pass the LEED AP BD&C Exam, Get Your Building LEED Certified, Fight Global Warming and Save Money! The USGBC released LEED v4 in GreenBuild International Conference and Expo in November, 2013. The GBCI started to include the new LEED v4 content for all LEED exams in late Spring 2014. We have incorporated the new LEED v4 content in this book. Starting on December 1, 2011, GBCI began to draw LEED AP BD+C Exam questions from Green Building and LEED Core Concepts Guide. We have also incorporated the latest information from this book. LEED (Leadership in Energy and Environmental Design) is one of the most important trends in development and is revolutionizing the construction industry. It has gained tremendous momentum and has a profound impact on our environment. From this book, you will learn how to: 1. Pass the LEED AP BD+C Exam. 2. Register and achieve LEED certification for a building. 3. Understand the intent of each LEED prerequisite and credit. 4. Calculate points for LEED credits. 5. Identify the credit path, submittal requirements, synergies, possible strategies and technologies, project phase, LEED submittal phase, and responsible party for each prerequisite and credit. 6. Earn extra credit (exemplary performance) for LEED. 7. Implement the related codes and standards. 8. Obtain points for categories not yet clearly defined by the USGBC. Most of the existing books on LEED and the LEED exams are too expensive and complicated to be practical or helpful. This guide fills in the blanks and demystifies LEED. It uncovers the secrets, codes, and jargon for LEED as well as the true meaning of going green. It provides a solid foundation and fundamental framework for LEED. It covers every major aspect of LEED in plain and concise language, and introduces it to ordinary people. This guide is easy to carry around. You can read it whenever you have a few extra minutes. It is an indispensable book for ordinary people, developers, brokers, contractors, administrators, architects, landscape architects, engineers, interns, drafters, designers, and other design professionals. What others are saying about LEED BD&C Exam Guide ... "Passed on first try, only used this guide "This is the best study guide HANDS DOWN. If you're serious about passing the LEED AP BD&C exam on your first try, this is the one you've been looking for! I bought Mr. Chen's LEED Green Associate Exam Guide 2 months ago and passed it on the first try as well. I purchased the USGBC reference guide and Mr. Chen's LEED BD&C Exam Guide. I never opened the USGBC reference guide, only studied from Mr. Chen's study guide. I followed Mr. Chen's instructions and studied the guide for 2 weeks (yes, I have a full-time job). I did ignore the mnemonics, not my learning style (makes it more confusing to me). The exam was not easy, but I prepared and stuck to this material. I am not a good test taker by no means. I reviewed the technical data of the guide about 6 times and ignored everything else I had read or heard about the exam. Here's a piece of advice that I picked up from this book, spend less time on practice tests and more time studying! I have a subscription to a web exam simulator (rated the best) and only did about 100 questions, until I realized that I was wasting my valuable time. Find a good book and stick to it. This is also a great reference guide to use on everyday projects. Review the material, try to understand it, then try to memorize it through repetition. I would like to shake your hand and say THANKS AGAIN MR. GANG CHEN !!! " —LOBO "Excellent Guide and Good Manual "I passed the LEED AP BD+C and the LEED AP ID+C exams this year and Gang Chen's books were my primary study material! The books are easy to read and use. Gang Chen provides study hints and guidance as well as an outline format that makes it easy for the reader to grasp key points. He also provides an excellent review of the entire accreditation process which can save people time in personal research. The books are more than study guides; they are helpful as reference manuals because of the easy to follow format. Definitely a keeper in my bookshelf for future project reference." —Karen M. Scott "Great resource for studying

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