Recommended Qualifications and Design Professional Selection Criteria for High Performance Green Building Projects

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The following is a general guideline for evaluating the qualifications of a design team for a typical green building project. This document provides a detailed overview of the types of things that the design team should be well versed in – in order to deliver a successful green building project. These qualifications are intended to be used for many building types but will be most helpful for low to mid rise office buildings, administrative buildings, university projects, laboratory buildings, classroom buildings, schools and even residential and student housing facilities. For certain building types and projects – other special qualifications may also be critical. This selection criteria and recommended qualifications listing supplements but does not replace or supercede the standard design professional qualification process.

"Whole Building / Integrated Design"

Design team should demonstrate experience and or clearly defined professional and technical qualifications with regard to whole building integrated design and should have past projects which demonstrate the ability to optimize the design and environmental performance of all aspects of the project – from site design, water conservation and energy conservation measures, materials and resources and indoor environmental quality issues. Team should be able to demonstrate in-depth understanding of the interrelationships between various building systems – and understand that optimum performance of one system inherently impacts other systems. For example – the effective use of climate responsive design (proper building orientation, massing and shading and effective use solar energy and passive cooling and heating attributes) and the use of high performance envelope technologies has profound impacts on lighting, electrical, heating and cooling system size and initial cost of these systems. In this example, a failure to optimize building orientation and massing can have profound negative impacts on both first cost and operational energy costs of the lighting, electrical and cooling systems.

Design based on Environmental Performance Objectives

In addition to meeting basic architectural program requirements, the design team should be comfortable working in an environment where they will also be expected to deliver a project that will have specific set environmental performance benchmarks. The building project will be expected to meet, within reason, certain pre-established performance criteria in terms of water use, energy use and resource management, construction waste minimization and waste recycling and landfill diversion rates, etc. For example – total annual energy use for a typical low rise office or classroom building – using whole building / integrated design concepts – should have an annual energy use in the range of 30,000 to 60,000 BTU/SF/year vs. that of a basic code compliant building that would more than likely be in the range of 60,000 to 90,000 BTU/SF/YR or more. This must be demonstrated through detailed computer based energy modeling. Project team should be willing to establish firm and aggressive energy performance objectives early in the project – based on past experience with the design of high performance buildings, or through the use of benchmarking tools such as the ENERGY STAR™ "Target Finder" software. Under this program, guideline energy objectives are weighted by building type and region. ENERGY STAR target score should be as high as possible – but at least in the range of 85 to 95 or higher. In most cases in our region, building energy use and loads are predominantly driven by building cooling loads and by energy required to pre-condition ventilation make-up air throughout the year. The building envelope, passive cooling features, and ventilation heat recovery system should be designed such that the total system peak cooling load should be in the range of 500 to

800 square foot (SF) per ton or greater, while maintaining standard indoor space temperature and humidity conditions – vs. that of a typical inefficient design that is likely to have a installed peak cooling capacity in the range of 250 to 400 square foot per ton. Finally – lighting power densities should be in the range of .75 to 1.0 watts per square foot or less while meeting standard indoor lighting levels (60 - 80 foot candles in office areas) and may actually operate at well under .75 watts per square foot – vs. an in-efficient design that may have installed lighting power densities of 1.5 watts per square foot or higher. Water use in the building should be in the order of 50% less than that of a conventional building of similar occupancy, that does not have modern water conservation technologies. Special consideration should be given to teams with past projects that have demonstrated and documented environmental performance in these ranges. Those without this kind of past performance record should be able to demonstrate how this will be achieved through the use of qualified consultants who must be retained throughout the design and construction process.

Cost Trade-off Principles

A clear understanding of cost trade-off principles goes hand in hand with the concept of whole building / Integrated Design. The various members of the design team must understand that in some scenarios – an increased investment in one particular building attribute, system, or component such as high performance glass, can actually result in NET project first cost SAVINGS and overall project first cost reduction – due to greater cost savings in another effected portion of the building construction such as resulting downsizing and initial construction cost savings in the building heating and cooling central plant and distribution system that occur when using slightly more costly high performance glazing. Understanding where these relationships and cost trade-offs lie is the key to achieving a cost effective whole building / integrated high performance green building design within the constraints of a conventional building budget. The GGGC can provide a listing of similar common cost trade-off scenarios which can be shared with prospective design teams. (See GGGC “Green for Less” strategies and technologies paper)

Real Green vs. “Green-Wash”

Many recent so-called “green” building projects are in fact not really very green. Simply using one or two green technologies in a building such as a living roof, or a few clever building products that have a high recycled content – does not make a building truly green. Additionally – some green technologies can be miss-applied and used in the wrong applications. For example, miss-application of gas fired “refrigerant free” absorption chillers which can result in inefficient operation under part load conditions, or the use of a very costly living roof system because it is a “cool” green technology – is not advisable when there are other less costly, but less “sexy” technologies such as rain gardens and bioretention areas that support ground water recharge. Emphasis should be placed on cost effective and truly environmentally beneficial and project appropriate technologies that are part of a comprehensive integrated green building scenario. Project teams should be able to clearly demonstrate both short term and long term cost benefits as well as provide true quantifiable environmental benefits that will result from the use of any proposed green building technology. When selecting projects which have an impact on building energy use – project team should have familiarity with and be willing to mandate the specification of ENERGY STAR ™ labeled products, appliances, equipment and building materials.

Life Cycle Assessment (LCA) Principles

In order for any team to be able to make effective decisions about green building strategies, they must be able to demonstrate the use of Life Cycle Assessment (LCA) principles. This concept takes a given building material or system and compares it to other alternative building materials and systems – from the perspective of the entire life of the respective material or system. This analysis considers all environmental aspects of the respective technology – from the origin of the raw materials that are extruded from the earth – to transportation of those materials to the manufacturing plant or mill, and on throughout the entire manufacturing and production and delivery process. LCA takes into consideration all aspects of the production of that end product – all embodied energy – including transit of all materials and the end product, all energy used in extraction and production, all water used, and all pollutants and resulting waste products that are generated and released into the air, water and land as a result of the production of that material. In addition, LCA takes into consideration the installation of the product and the long term durability, operation and maintenance of the material. End use and disposal, re-use, and/or the energy and water and resources associated with recycling that material (compared to another material) is also factored into a true LCA analysis. A material that has a low embodied energy and low impact on the environment while also achieving attributes of durability and having a long life will be favored over one with a high embodied energy or high use of water and/or one which is less durable and has a shorter life span and is not easily recyclable or re-usable. In true LCA, an emphasis is placed on reuse and recycling vs. down-cycling of materials and resources. LCA is perhaps one of the most sophisticated aspects of green building design as many of these attributes are hard to quantify. While having a team with an LCA expert on board is certainly desirable, a design team need not be an expert at LCA in order to be effective and to appreciate the importance of at least the cursory use of LCA principles when evaluating and comparing various green building materials and systems. While there are various computer based tools that are being developed to assist designers with LCA such as the BEES software developed by NIST, or similar programs being developed by ATHENA, familiarity with the use of these tools is certainly not mandatory – but helpful and strongly encouraged as it aids in effective decision making when evaluating green products and materials. A basic understanding of the core principles of LCA is desirable among all members of the green design team, not just one team member.

Cost of Green

Project team must either have demonstrated experience in the delivery of high performance green buildings for little or no net increase in construction cost – or they must be willing to learn by example – and implement these cost saving green savings – based on a portfolio of recent cost effective green building projects located in PA. Special building types such as hospitals, or laboratories or other special occupancies etc may be an exception. Experiences by other state agencies and local school districts shows that it is in fact possible to achieve a LEED Silver or LEED Gold rating – for little or no net increase in first cost for office buildings, schools and classroom type buildings. Recent LEED Certified green building projects ranged from $89/SF for a LEED certified green building to $98/Sf for a LEED Gold certified building which is well within the normal cost range for office buildings in PA. Clearview Elementary school in Hanover PA, a recent K-12 school project was completed for around $115/SF and was just slightly below the state average for new elementary school construction in 2002. A national database of the costs of recent green building projects shows that it IS possible to achieve a reasonable level of green performance on a conventional budget, but this is usually only achieved through the use of true whole building integrated design process and effective use of climate responsive design principles.

Sustainable Site Design

Demonstrated experience with minimal site disturbance, preservation of key site features, designing building to lay of land vs. carving site to suite building…vs. the traditional method of site development which involves clear-cutting of all mature trees and vegetation from property line to property line, needles disruption of areas outside of the immediate construction zone and needless removal or compaction of vital pervious organic upper soil mantle, and massive grading and excavation of the site which is often followed by costly but un-successful attempts to restore and re-landscape with immature trees and landscaping materials that will take 20 to 30 years to achieve comparable environmental benefits in terms of quality of soil, air and hydrology. This type of development is not appropriate for green building projects and has been shown to not only be environmentally destructive but not especially cost effective. Identification and preservation of key natural site features and the design of the building and all related site attributes, around these site features is the key to sustainable site design. Other aspects of sustainable site design including the use of Low Impact Development (LID) strategies, are outlined below.

LID Infiltration Based Storm Water Management

In accordance with PA DEP Comprehensive Storm Water Management Policy updated in the fall of 2002, the design team should be able to demonstrate the ability to effectively implement Low Impact Development (LID) practices when developing the site. (Visit www.dep.state.pa.us - use keyword "Stormwater Management" for info about PA Stormwater policy and related issues, policys and regs. including NPDES II and MS-4 and state E&S Requirements.) Storm water solutions should be unique to the site and should effectively incorporate and respect existing site hydrological features. In the interim – while PA DEP is developing its new LID manual – the design team should be familiar with and be able to effectively use strategies presented in other regional LID manuals that have been approved by the PA DEP such and the Maryland "National" LID Manual. The most qualified teams will be able to demonstrate actual project experience using LID strategies such as Rain Garden Bioretention areas, parking lot integrated bio-strips, open grassy swales, buried gravel infiltration trenches or buried infiltration pits/gravel beds, parking lot integrated storage and ground water recharge beds, pervious paving systems (gravel pave, grass pavers, pervious bituminous asphalt, pervious concrete, etc) Demonstrated experience or qualifications should show a shift way from the use of standard detention basin based hold and release BMP's in favor of a focus not just on retention – but on retention that incorporates effective water quality measures, filtration, bio-filtration, infiltration and ground water recharge so-as to emulate or restore the hydrology of the pre-developed site. The end result should be a design team that is capable of delivering a design solution that results in no net increase in storm water runoff from the site when comparing the pre and post developed hydrological conditions. No net impact on hydrology – is the goal. The question should be – does this teams civil engineer have the qualifications and knowledge to deliver such a design? Familiarity with the use of native plants and trees which are drought resistant and hardy is also a vital element of LID and sustainable site design principles.

Living Roof Technology

For Urban /inner city projects where the opportunity for traditional LID technologies is limited, the project team should demonstrate experience with Living Roof technology. Living Roofs generally are more costly than other LID strategies and should only be used where more practical and more environmentally preferable infiltration ground water recharge based LID technologies cannot be used due to site constraints. Living roof technology – while beneficial –

is not the cure all for rain water management as it has no ground water recharge component. It does however provide storage and filtration, detention, and evapotranspiration. Other benefits are possible energy savings during summer months and carbon sequestration and air quality benefits.

Water Quality and Conservation

The project team should have first hand knowledge of modern day water conservation strategies and advanced water conservation plumbing fixtures that WORK! Project team should be familiar with and prepared to specify projects such as waterless urinals, water saver faucets, water saver showers and water saver toilets which have been proven to be safe and durable and much less costly to operate and maintain. Knowledge of what products work and which ones do not is vital – especially with water saver toilets. For every one that works well, there are 10 on the market that do not.

Project team should be familiar with the design of Rain Harvesting, storage and filtration, gray water recycling and the associated filtration and sterilization methods including use of UV filters and other current technologies as these technologies should be strongly considered for most if not all modern green building projects. Team should be familiar with and willing to implement the most common uses of grey water or harvested rain water such as toilet flushing and irrigation and HVAC system (boiler or cooling tower) make up/supply water and must be willing to go to bat and stand behind the use of these technologies and satisfy local code and regulatory administrators. Team should demonstrate that they understand the implications that various HVAC systems have on building water usage – ie. comparing water use of a ground source heat pump system (uses almost no water after initial system charging) vs. that of a more conventional cooling system with an open loop condenser system which uses an open cooling towers that require a constant supply of make-up water.

Energy

Energy use in buildings is an aspect of green design that has perhaps more profound long term environmental impact than any other single attribute. In fact – while much time and analysis (LCA) can be invested comparing one building finish or material with another in terms of embodied energy or resulting pollution and adverse environmental attributes, the bottom line is that the actual energy use of the lighting, electrical and heating, ventilation and cooling systems in a building will have far greater implications in terms of energy use and pollution – over the life of the building – than will all of the building materials used in the building multiplied 100's of not 1000's of times over. Design decisions that impact the buildings operation and energy use are the most profound from an environmental aspect. Therefore selecting a team that fully understands how to design what we call a "high performance building" is imperative.

Understanding and effectively applying the principles of "Climate Responsive Design" is the single most vital qualification that a green design team must possess. This concept revolves around the buildings relationship and ability to respond effectively to climatic attributes of the selected site. With regard to team qualifications – the question is – does the team know how to implement an effective climate responsive design solution? Unfortunately 70-80% of all of today's new buildings are designed with total disregard to CRD. CRD has profound energy saving implications for little or usually no added first cost. Design teams who have mastered the art of CRD can deliver an extraordinary energy efficient building for LOWER first cost – using CRD principles. CRD is a combination of making best use of proper orientation of the building and proper placement of building massing and shading elements with respect to the sun throughout the day and over all seasons of the year as sun angles change. CRD is the optimization of these features such that lighting, heating and cooling energy use in the building is optimized using these free passive features that are simply part of good climate responsive architecture. Effective use of passive cooling/shading, passive heating and effective and aggressive use of natural daylighting are the most crucial elements of Climate Responsive design. Other features such as effective use of landscaping and integration of building elements which provide and accentuate natural ventilation of the building during cooler seasons will have a profound impact on annual energy use. Simply knowing what basic building forms generally result in lower energy use such as buildings that are longer in the east west axis- generally, which have predominant glass exposures to the north and controlled (shaded) glass to the south, and little or no glass facing east or west – are paramount but often miss-understood. Simply optimizing building form, orientation, glass and daylighting can impact annual energy use by a factor of 25 to 40%!

The design team for a true high performance green building absolutely MUST be able to demonstrate a sound understanding of Climate Responsive Design (CRD) and aggressive use of natural daylighting and passive cooling/shading strategies. Those who are experienced and those who are not will benefit from a commitment to using early schematic design tools such as Energy 10 software (Developed by the US Department of Energy and available from the Sustainable Buildings Industries Council) which is designed specifically to aid in the early decision making process in terms of climate responsive design features such as building massing, shape, and orientation. The use of Energy 10 then lead to the next steps if energy, HVAC, electrical, daylighting and lighting system analysis.

High Performance Envelopes and Whole Building Energy Modeling

As the project moves from schematic design into design development phases – the project team should be able to demonstrate the ability to continue to perfect and optimize Climate Responsive Design elements while also adding to the building – a high performance envelope and high performance lighting and Heating, Ventilation and Cooling systems. The team must clearly demonstrate familiarity with current energy technologies in both the building envelope side and the systems side. Experience with energy conservation strategies – high performance envelopes, technologies such as insulated concrete forms, insulated structural roof decking systems and structural insulated panel systems, tight building construction, thermally broken high performance glazing systems, and other thermally broken wall, floor and roof assemblies, cool roof technology, etc., in addition to the standard state of the art energy efficient lighting, electrical and heating cooling and ventilation equipment is essential The optimization of all of these systems is achieved by using whole building energy modeling. This computer modeling and analysis can be done with internal design professionals with proven experience in using state of the art computer based building energy modeling software, or it can be achieved by using outside consultants who specialize in the use of building energy modeling tools such as DOE-2, EZ-DOE, Energy Plus or other comparable software. If outside consultants are used – they must be a part of the project from the very earliest stages all the way through the last decision-making processes in the Construction Document (CD) phases. Any design decision that impacts building energy use should be analyzed. The design team must understand this and be committed to carrying through with this analysis. This requires the creation of a very interactive design team where architects, interior designers, lighting and electrical engineers, HVAC engineers and the energy modeling team exchange information back and forth from project start to project end. Simple load analysis tools such as those by Carrier or Trane are basic design tools, are generally not adequate or acceptable for use in high performance green building design, and do not accurately model thermal mass and solar related benefits of climate responsive design (daylighting and passive cooling and heating strategies) and are therefore not an acceptable alternative to pure energy modeling. This energy modeling should have the ability to incorporate design attributes that result from other computer modeling such as daylighting modeling and interior lighting design and modeling software.

Daylighting Design and Daylighting (computer) Modeling
The project team must have the ability to effectively use daylighting modeling tools such as "Daylight" or "Radiance" in order to truly optimize the design of the daylighting features in the building. This daylighting modeling must be done in conjunction with and as an extension of the other modeling such as schematic modeling with Energy 10, and subsequent detailed DOE 2 or Energy Plus Energy Modeling and Lighting system modeling. Effective use of these daylighting modeling tools drives the design teams ability to effectively incorporate into the architectural program, floor plans and elevations- key building elements and strategies which take into account prevailing sun angles and building massing – so that there is a relationship between placement of interior spaces and accessibility to the highest quality of available natural daylighting. In prime work spaces, all proposed daylighting designs that are verified using this daylight modeling software must assure good indirect diffuse daylighting – and must avoid direct daylight and glare wherever possible. In other areas such as circulation spaces – direct daylighting may be acceptable. Previous projects should demonstrate the teams ability to place emphasis on most effective use of "controlled" southern sunlight as well as the use of indirect diffuse natural northern light both through vision glass and roof monitors and clerestories that provide controlled natural daylight deep into the occupied spaces. Team should have a clear understanding as to both the quality of light issues as well as the energy implications of window placement and daylighting and shading elements. Emphasis should be on making positive use of north south facing glass, and benefits of minimizing uncontrolled glass on eastern and western facades.

Familiarity with glass types, selective coatings – when and when not to use low-e glass and the impact that low-e coatings or tinted glass may have on daylighting elements and net building energy use. While the use of a high performance glass with a low-e coating is generally desirable – this is not the case for controlled south facing glass that is used in conjunction with external roof overhangs or other external passive shading elements commonly used in an engineered daylight harvesting system.

Project team should be able to demonstrate the ability to effectively design daylighting and shading controls – interior and exterior, light shelf, louvers, baffles, fins, deep roof overhangs, massing, clerestories and roof monitors. Note- when reviewing a design teams qualifications – generally speaking - improper and or widespread use of un-shaded roof skylights is a sure sign of a lack of familiarity with good daylighting and energy conservation principles. Use of south facing shaded vertical glass in a roof monitor or clerestory with a deep roof overhang is always more favorable from both a daylighting quality and energy conservation standpoint. Skylights in general are not desirable from a net energy use perspective unless they are on north facing roofs. Then energy savings from the daylighting is negated by the intense cooling load created by the direct solar gains during summer months.

High Performance Lighting and Lighting System (Computer) Modeling
The design team should be able to demonstrate the ability to truly optimize interior and exterior lighting design through the use of modern computer based lighting modeling and engineering

design tools. Color and texture, space geometries, light reflectance of all surfaces and finishes and furniture, etc…play a key role in lighting system performance and optimization. Project team members or consultants should be able to demonstrate a clear understanding of the relationships between lighting system, the space and surfaces and finishes including first hand knowledge of which elements have the greatest impact on potential optimization, first-cost and operating cost savings. Comparing different finishes and paints and the ability to optimize and model various types of reflective surfaces on ceilings and interior wall surfaces that are vital to improving lighting system performance.

The project team should understand the importance of keeping energy and daylighting and lighting modeling consultants on board throughout entire project- using interactive "integrated design process" where feedback from modeling drives architectural and engineering design decisions, and must make a commitment to doing so. Modeling is used as a design and decision making tool throughout entire design process not just as part of a green light thinking process during schematic design. An understanding of the importance of this process should be evident when evaluating the design team.

The project team should be able to demonstrate knowledge of current state of the art advanced energy efficient lighting systems and controls including the use of energy efficient solid state ballasts and T-8 and T-5 types of lighting systems, a broad range of compact fluorescent fixtures, both direct and indirect lighting systems, indirect ambient task lighting concepts, and modern dimming and lighting controls including fully dimmable and digitally addressable electronic ballast technology. Familiarity with ENERGY STAR ™ labeled products is very desirable. Project team should understand how to effectively integrate both artificial lighting and natural daylight controls.

Ground Source Heat Pump Technology

The use of Ground Source Heat Pump technology should be given serious consideration for every project as the resulting operational (energy) and maintenance cost savings can be as much as 20 to 40 below that of other types of HVAC systems. The project team should be able to demonstrate the ability to design and implement ground source heat pump technology for projects where this is an appropriate application such as small to medium office buildings, schools, classroom buildings, admin buildings, residential/student housing projects, etc. Project teams with demonstrated experience in delivering this technology such that it is cost effective on a first cost basis should be given prime consideration. Team should be aware of widespread mis-conceptions about the actual cost of ground source heat pump technology. A team that is familiar with recent applications and installations will be aware that GSHP technology CAN in fact be very cost competitive on a first cost basis while also affording 25% to 35% savings on annual energy use. Total building mechanical system cost for several recent office building and school projects using GSHP technology in PA have been between $12 and $16 per square foot (of occupied building space) including all well field costs which is competitive with less energy efficient systems such as four pipe central boiler and chiller systems. Project teams with no direct past experience with GSHP technology should be able do demonstrate their ability to deliver such a project on a first cost basis – through the use of qualified consultants. Familiarity with the concept of hybrid GSHP technology where well field size can be reduced by up to 30% or more through the use of small package boiler or chiller is desirable for sites where well field costs are driven up by soil conditions.

Familiarity with new products entering the market place including 1) hybrid heat recovery ventilation equipment that is specifically designed for use in conjunction with water source and/or ground coupled heat pump systems; 2) larger package HVAC equipment designed to compliment GSHP heating and cooling systems.

Materials and Resources
The project team should be able to demonstrate in depth knowledge and past performance of modern recycled content materials such as Blended Cements (Fly-ash and slag additives), bio-composites, engineered systems and composite structures such as insulated concrete forms and structural insulated roof and wall panel systems. These systems not only have environmental benefits but often result in notable net building first cost savings when applied properly. In some cases the net cost savings are a result of cost reductions in other effected aspects of the building construction.

Construction Waste Recycling and Reduction
The project team should also be able to demonstrate a firm commitment and qualifications or past experience with regard to the development and implementation of an on-site construction waste sorting and recycling program. Implementation of an effective construction waste recycling program with a diversion rate of 80% should be mandatory for all projects. All teams being considered should be comfortable making a commitment to achieving this goal and they should understand how to implement such a program. Off site sorting of construction waste is discouraged as it significantly increases the cost of construction recycling. On site separation will actually result in first cost savings for nearly all projects due to the significant reduction in landfill tipping fees.

Indoor Environmental Quality
Project team must have strong familiarity with the specification of building materials and furnishings that do not contain and off-gas Volatile Organic Compounds (VOC's.) While many new products such as VOC free paints and adhesives are in the market – it is often difficult to know which ones work well and which ones don't. Having past experience with these materials, or the ability to effectively evaluate their durability, is essential. In addition, may types of furniture, desks, tables, book-cases, etc. are made from medium density fiberboard which traditionally contains high levels of VOC's. Familiarity with modern products and furnishings which do not use VOC based binders is beneficial. Many new alternatives to MDF are on the market including "wheat-board" which uses agricultural waste (wheat straw and wheat husks) combined with natural binders which contain no VOC's.

Members of the design team should be aware of the benefits of monitoring of CO2 in modern buildings, the effects that poor ventilation and high CO2 have on building occupants. The team should be able to demonstrate the ability to design, specify and implement measures for measuring and managing CO2 in buildings.

The project team should be familiar with and be qualified in designing dedicated ventilation systems which operate based on occupancy and actual measured indoor air quality including CO2 vs standard ventilation systems which are integrated in with heating and cooling systems and which only provide needed ventilation to the occupied spaces when there is a call for heating or cooling. Dedicated outdoor air ventilation systems will provide the needed ventilation during all occupied periods regardless of whether there is a call for heating or cooling in any given space. These dedicated ventilation systems should also be able to respond to elevated levels of CO_2 by increasing ventilation rates in those effected spaces. This type of control should be mandatory any any spaces of assembly such as conference rooms and large meeting rooms and for school buildings – all classrooms should be monitored and controlled based on actual space CO_2 levels.

The design team should demonstrate knowledge of Thermal Comfort – ASHRAE Standard 55, the importance of effective environmental control systems, and the importance of effective humidity control in the building. In addition to understanding the importance of providing humidification during dry winter months and dehumidification during humid periods. Team should be familiar with current state of the art energy recovery ventilation strategies including desiccant based dehumidification and heat recovery equipment.

Building Commissioning

The project team should be able to demonstrate strong qualifications in the area of building commissioning. Project teams should be encouraged to implement an aggressive building commissioning program.

USGBC LEED Rating System

The project team should be familiar with all aspects of the United States Green Building Association's (USGBC) Leadership in Energy and Environmental Design (LEED) green building rating system and should be able to be implement the certification process for the appropriate version of the LEED rating system for the respective project. One or more members of the project team should be LEED accredited which signifies their level of familiarity with the LEED rating system and the certification process. It should be noted that LEED certification alone does not in any way signify ones qualifications with regard to being able to design a green building or the necessary elements therein.