

TECHNICAL TIPS

A GUIDELINE FOR COMMISSIONING AND
AUDITING BUILDING SYSTEMS

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Building technology in the eighties has focused on minimizing energy consumption. Sophisticated mechanical and electrical systems were developed and new products have been utilized in building construction to produce an energy efficient, air-tight building envelope. These same developments, however, have combined to create a polluted and often uncomfortable indoor environment, one that manifests itself in increasing tenant complaints, reduced productivity and even disease. It has been estimated that up to 90% of the currently available office building stock has the potential to produce these problems and become "sick buildings". Resulting lawsuits have placed enormous pressure on designers, builders, owners, managers and employers to revise their priorities.

Fortunately, such problems can now be eliminated. Healthy, energy efficient buildings need not be designed in a fashion or at a cost that detracts from their appeal to conventional developers and office tenants. The careful application of existing technologies, together with attention to environmental site planning can lead to responsive, energy efficiency and environmental quality without compromising conventional office space marketing requirements.

The Building Commissioning Process

The most effective approach to creating a healthy building is, of course, to design and build it that way from the outset. To accomplish this, the design delivery team, including architects, engineers, contractors and their clients must practice a preventative approach known as "building commissioning": a comprehensive evaluation of a building project to guarantee the effective performance of the environmental control systems that serve the modern building.

Modern structures encompass many system control elements such as temperature, lighting, noise level, the intended physical and architectural characteristics of the space, the intended sense of enclosure and the type and proximity of occupants. Environmental quality is a result of the interaction of all these factors. All consultants must work as a team and actively pursue their roles with one team member designated as the "Commissioning Authority". It is generally thought that the architect, because of their traditional role of prime consultant, should take on this responsibility.

The Commissioning Authority is the only body that has the overall picture of what a building and its systems need to do. They must recognize that:

Meeting design criteria of Building Codes does not guarantee effective environmental control.

* Air balancing and certified functional performance of equipment do not necessarily imply that a building works as an effective or comfortable environment control system.

* Buildings are not static, they evolve over time.

The Commissioning Authority should be involved in commissioning from the pre-design phase of a project through to the certification of substantial completion and beyond to ensure the ongoing performance of the building.

The following points provide a summary of the role during the four phases of the building delivery process as defined by the proposed new ASHRAE Guideline. (ASHRAE 1987)

Pre-Design Phase

The commissioning authority and the client should confer to establish performance needs of a building and define any possible conflicts which result from these requirements. These definitions must then be documented and provided to the secondary consultants by the commissioning authority.

Construction Phase

The role of the commissioning authority during construction adheres closely to that of traditional construction supervision. He/She must make site inspections and also coordinate inspections of secondary consultants and ensure accurate reporting and documentation of construction design changes.

Acceptance Phase

The commissioning authority must now co-ordinate and document test results and must verify that results have met the stated requirements. This should be done prior to the architect certifying that the building is complete.

Post Acceptance Phase

Although the contractual commissioning process ends with the formal acceptance of the building, post acceptance commissioning is a critical step to maintaining the effective, ongoing functioning of the building. As uses and functions of the building change, they need to be adapted to meet the changing requirements of occupancy and utilization. It is therefore appropriate for the commissioning authority to maintain a history of the building, recording changes made and implementing recommissioning procedures for building systems.

By overlapping the pre-design, design, construction and post construction phases of a building project, building commissioning will ensure that a building meets the needs of the tenants on completion and that the environment systems continue to provide comfortable and healthy conditions over the building's lifetime.