



## **SYNOPSIS OF AUGUST 26, 2014 UPDATE TO DESIGN GUIDELINES FOR HVAC AND CONTROLS**

### **Background**

As part of developing the original **HVAC and Controls Performance Assurance Program**, the New Mexico Public School Facilities Authority (PSFA) created a document describing design guidelines for heating, ventilating air conditioning (HVAC) and controls systems in school construction and renovation. These guidelines were incorporated into the *HVAC and Controls Performance Assurance Program Manual* as an appendix and originally published in June, 2007. An update to the guidelines with some revisions superseded the original in August, 2007.

The purpose of the guidelines was to provide direction in a number of key areas to Design Professionals and school districts for the design of HVAC and controls systems. The intent was to facilitate the design process and ensure that designs of these systems will be acceptable and meet PSFA requirements for performance, serviceability, cost of ownership, and so forth.

Over time, a considerable amount of practical experience has been gained in the implementation of these *Design Guidelines for HVAC and Controls* and evolutionary changes in technology and requirements have emerged. In addition, the recent comprehensive review and update of the **HVAC and Controls Performance Assurance Program** identified a number of issues that needed to be addressed through improvements in the Design Guidelines.

It was also determined that the importance of the Design Guidelines merits a document separate from the *HVAC and Controls Performance Assurance Program Manual*. The original purpose and intent of these guidelines remains the same and this new document updates and adds or expands discussion where needed to provide improved direction to address issues identified, changing technology, and other considerations to assure that designs meet the requirements of the PSFA.

### **Summary of Updates**

The paragraphs that follow summarize the additions, changes, deletions, and other revisions incorporated into this update.

#### **Section 2.0 DEFINITIONS AND ACRONYMS**

There are a number of terms and abbreviations used throughout the document so this new section was added to provide definitions and for consistency with those used in the **HVAC and Controls Performance Assurance Program**.



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### **Section 3.0 GENERAL DESIGN GUIDELINES**

The discussion in this section is expanded to add reference to the ASHRAE BACnet<sup>®</sup> Standard for controls and automation systems, incorporate PSFA guide specifications, and provide direction for design of appropriate HVAC systems for learning environments. These include a number of parameters to be used for determining the best system for a particular situation including discussion of project scale, water quality and cost of energy.

### **Section 4.0 STANDARDS OF COMFORT**

Reference to the New Mexico Public School Adequacy Planning Guide has been added.

### **Section 5.0 ENERGY EFFICIENCY**

Reference to ASHRAE Advanced Energy Design Guide for K-12 School Buildings is added and enumeration of previous guidelines from NM EMNRD was deleted.

### **Section 6.0 MODELING**

This is a new section discussing integration of software models including Building Information Models (BIM).

### **Section 7.0 LIFE CYCLE COSTS**

The discussion is expanded to include incorporation of National Institute of Standards and Technology (NIST) Handbook 135, expectations and requirements for life cycle cost analyses, and a table with examples of current input data.

### **Section 8.0 SUSTAINABILITY**

A discussion of the concept of “sustainability”, the intent of sustainable design, and reference to the ASHRAE Advanced Energy Design Guide for K-12 School Buildings as PSFA industry standard baseline have been added

### **Section 9.0 SERVICEABILITY**

Text is revised for updates related to staff capabilities, equipment location, mechanical room sizing, and equipment access.

### **Section 10.0 INTEGRATION WITH OTHER BUILDING SYSTEMS AND COMPONENTS**

The discussion is expanded to incorporate requirement for ASHRAE BACnet<sup>®</sup> Standard, security of controls and automation systems, IP design, and electronic metering for measurement and verification per the design specification defined in UNM GSA 02-24-14 with EMNRD.



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### **Section 11.0 HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS**

Text relative to particular systems is replaced with reference to ASHRAE *Advanced Energy Design Guide for K-12 School Buildings* and a comparative table for different system types is added along with discussion of Energy Recovery Ventilator units. The discussion of guidelines for specialized areas for electronic equipment and spaces for transformers/switches is expanded. Prefilter requirements for air filtration have also been added.

### **Section 12.0 BUILDING MANAGEMENT AND CONTROL SYSTEMS**

The discussion in this section is expanded to include requirements for ASHRAE BACnet® Standard, individual and zone space temperature control, building control Direct Digital Control (DDC) systems, workstations, and integration with existing and/or legacy systems. Design professional responsibilities with regard to integration of controls provided by equipment manufacturers are added to this section. In addition, brief discussions of lighting controls and remote monitoring capability are included.

Further, important updates have been made to the guidelines and requirements for documentation, system installation and performance, typical system components, utility metering, training, and control system testing.

### **Section 13.0 DOCUMENTATION AND REPORTS**

This is a new section with the PSFA's requirements for project documentation and records.

### **REFERENCES AND SOURCE MATERIAL**

This section is expanded to include the additional documentation referenced in the update.