



Williams Notaro & Associates, LLC

MECHANICAL, ELECTRICAL, PLUMBING & FIRE PROTECTION CONSULTING ENGINEERS

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Searching for Better Performance Beneath the Surface: One Path to Better Computer Room Cooling by Rupert Alfiler, EIT, LEED® AP

Have you peeked under your floor lately? I'm referring to your computer room's raised floor. Is it a streamlined metal and plastic river of information? Or does it more closely resemble the technical term "rat's nest"?

Believe it or not, the way you organize the unseen regions of your company's computer room can affect your computer equipment's performance.



Typical down-flow type Computer Room Air Conditioning (CRAC) Units function by pressurizing the plenum beneath the raised floor. Cool air from the floor plenum rises through perforated floor tiles strategically located in front of the computer equipment. The fans in the computer equipment draw the cool air through the component keeping it at an acceptable operating temperature.

An unobstructed flow of cool air under the raised floor is vital in order to keep computer equipment operating within the environmental parameters established by the manufacturer. In densely loaded racks, internal air temperatures can increase to upwards of 100 °F if not properly supplied with a constant source of cool air.

Because floor space is valuable, adding CRAC Units may not be desirable. Since it can be very difficult to increase the size of your computer room, maximize the use of the space you have by neatly organizing ancillary components (cable, conduit, piping, equipment, etc.). When cooling from below, the under floor space should ideally serve only as a dedicated air plenum.

How can you liberate your raised floor space?

- ♦ Eliminate under floor components altogether by routing them above the equipment in ladder racks.
- ♦ Lay out the raised floor structure with future rack and cooling capacity in mind.
- ♦ Early in the project, designate space for future equipment to be effectively and efficiently installed.
- ♦ Organize cables in tight, labeled bundles.

- ♦ Eliminate slack in cabling that consumes space.
- ♦ Eliminate all abandoned components under the raised floor.

If locating components under the raised floor is unavoidable, you should:

- ♦ Lay cabling on the floor in small, tight bundles and minimize where wiring bundles cross to avoid blocking airflow.
- ♦ Locate cable, conduit, piping and/or equipment away from the air discharge of the CRAC Units to allow the air to flow unrestricted to the perforated tiles.
- ♦ Locate cable, conduit, piping and/or equipment under the hot aisles whenever possible.

Take a big step towards better performance by adhering to the original design intent of your raised floor -- **to distribute cool air to your equipment**. Your computer room will run more efficiently and you will save money with a more efficient cooling system.

Contact WNA for information on how we can improve your computer room's performance.

Rupert Alfiler, EIT, LEED® AP Mechanical Engineer

Mr. Alfiler is a mechanical engineer with Williams Notaro & Associates, LLC. He holds a Bachelor of Science in Mechanical Engineering from Virginia Polytechnic Institute and State University, and has earned his LEED® Accredited Professional (AP) and EIT designations. Mr. Alfiler has performed mechanical and plumbing design work for such clients as AOL, C-SPAN, The MITRE Corporation, Navy Federal Credit Union and the Inter-American Development Bank.



Did You Know?

The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) in conjunction with the Illuminating Engineering Society (IES) and the US Green Building Council (USGBC) are proposing a high-performance building standard and stronger version of Standard 90.1.

Being released in 2010, the proposed Standard 189.1 *Standard for the Design of High Performance, Green Buildings Except Low-Rise Residential Building* will provide a total green resource for local and state governments looking to set building code requirements to reduce energy use. Topic areas to be covered include green building rating systems, site sustainability, water use efficiency, energy efficiency, indoor environmental quality, and the building's impact on the atmosphere, materials and resources.

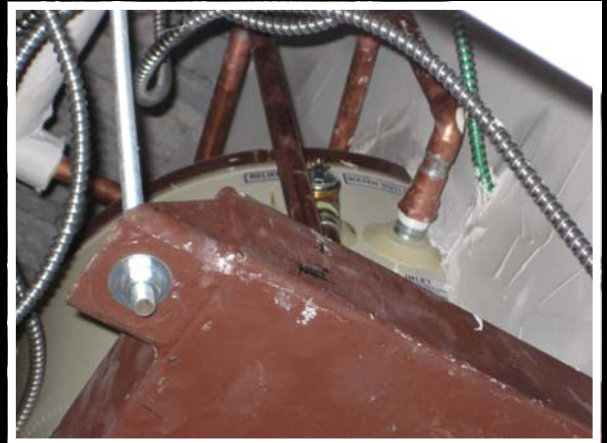
This standard will be the first code-intended commercial green building standard in the United States when published in early 2010.

Winter 2010 Contest - Enter to Win \$100 Gift Card

Every season we feature a photo on our web site that illustrates the importance of including Construction Administration in the Engineering scope of work. Even small, seemingly unimportant installation deficiencies can cause poor system performance, increased maintenance, or reduced equipment service life. Visit our web site at www.wnainc.com and enter the Installation Blooper Contest by viewing the current blooper photo and selecting which multiple choice response best identifies the installation blooper. Correct respondents are automatically entered to win a \$100 gift card to Shell Oil. Drawing will be held February 19, 2010.

Featured Fall 2009 Blooper

Our Fall 2009 Contest featured mechanical and plumbing equipment installed in a manner that did not provide adequate service clearance and access to critical components such as electrical connections, piping connections, and nameplate information. In addition to having adequate access clearance, such equipment should be supported from the building structure so as not to affect the functionality of architectural features within the space.



Winner

Congratulations to Scott Dychtwald, project manager with SIGAL Construction in Arlington, Virginia. He correctly identified the Fall 2009 installation blooper and received a \$100 gift card.



Enter our contest at www.wnainc.com
Drawing will be held February 19, 2010.