

Underfloor Air Distribution: Issues and Experiences



What Is It?

- Use of an Access Floor Plenum as Supply Air Path
- Use of Floor Diffusers to Supply Air to Space
- Exploitation of Space Temperature Stratification
- Ceiling Return

Why Do It?

- Workplace flexibility
- Technology flexibility
- Architectural design opportunity
- Improved air distribution
- Better IAQ
- Individual comfort control
- Reduced energy use

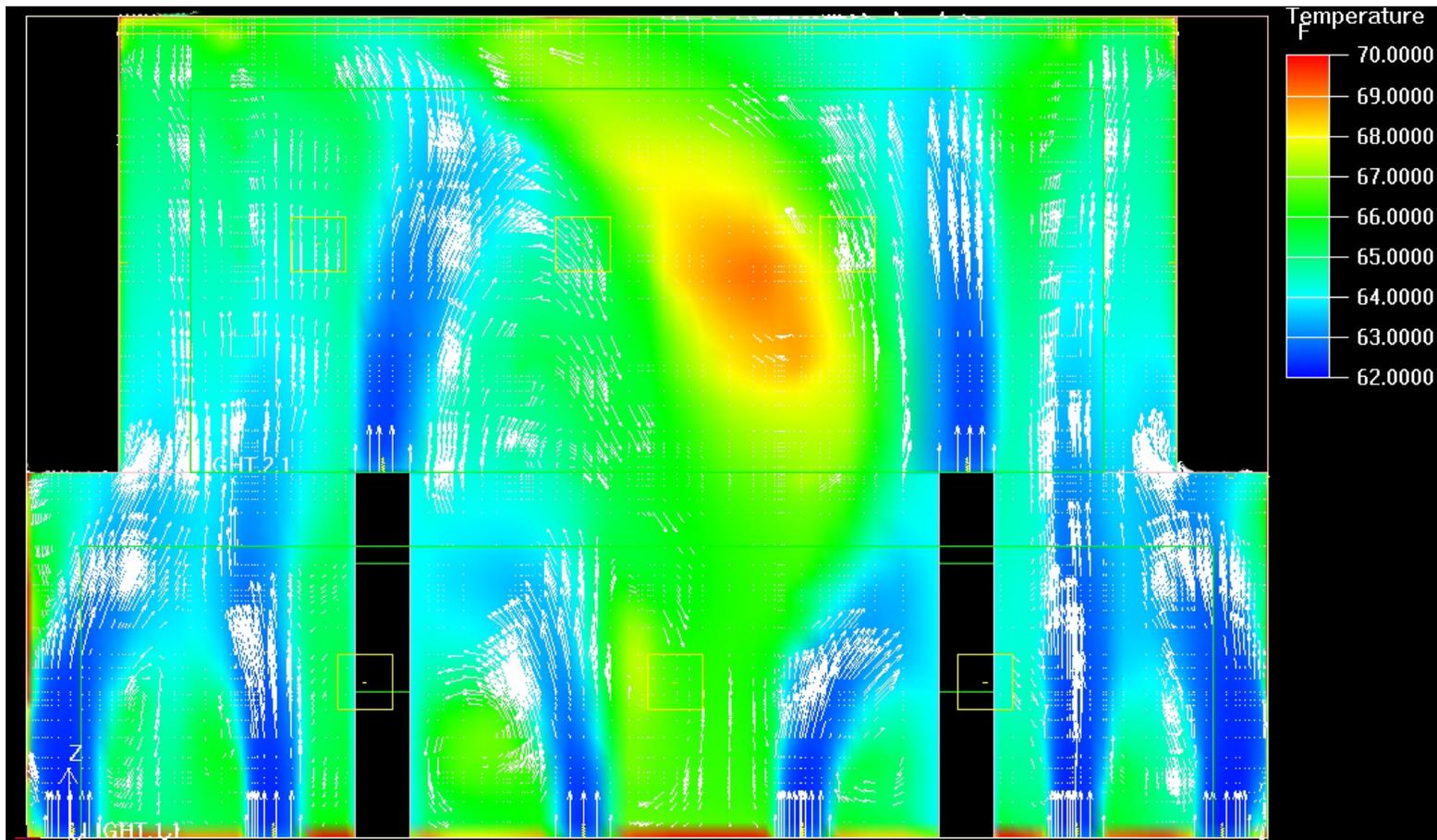
Design Process

- Rethink design issues and typical solutions
- Consider expanded opportunities
- Integrated design - trade-offs between systems
- Address code issues & local approvals

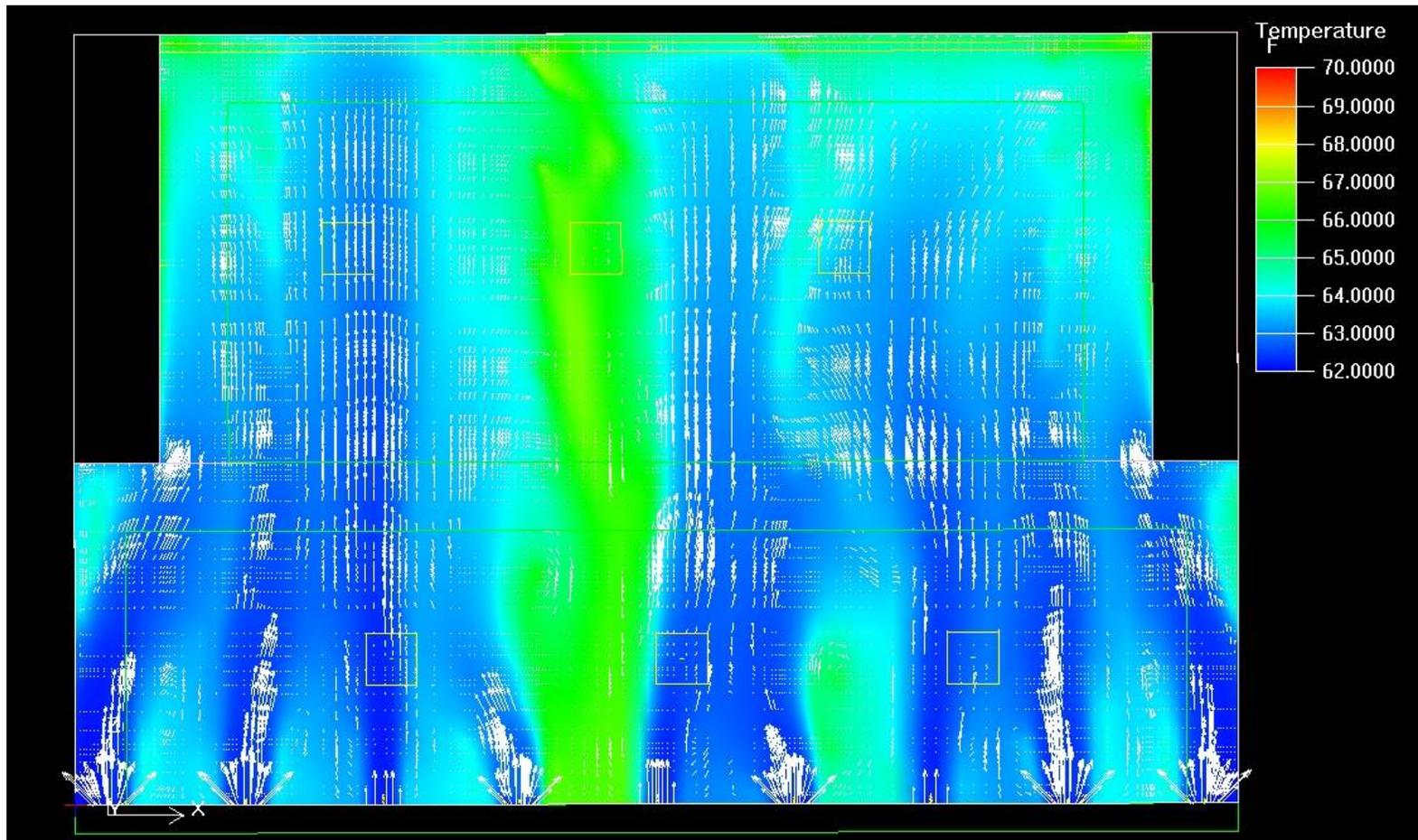
Technical Issues

- Uniform Supply Temperatures
- Avoiding Cold Feet
- Controlling Humidity
- Modulating Heating and Cooling Capacity
- Leakage

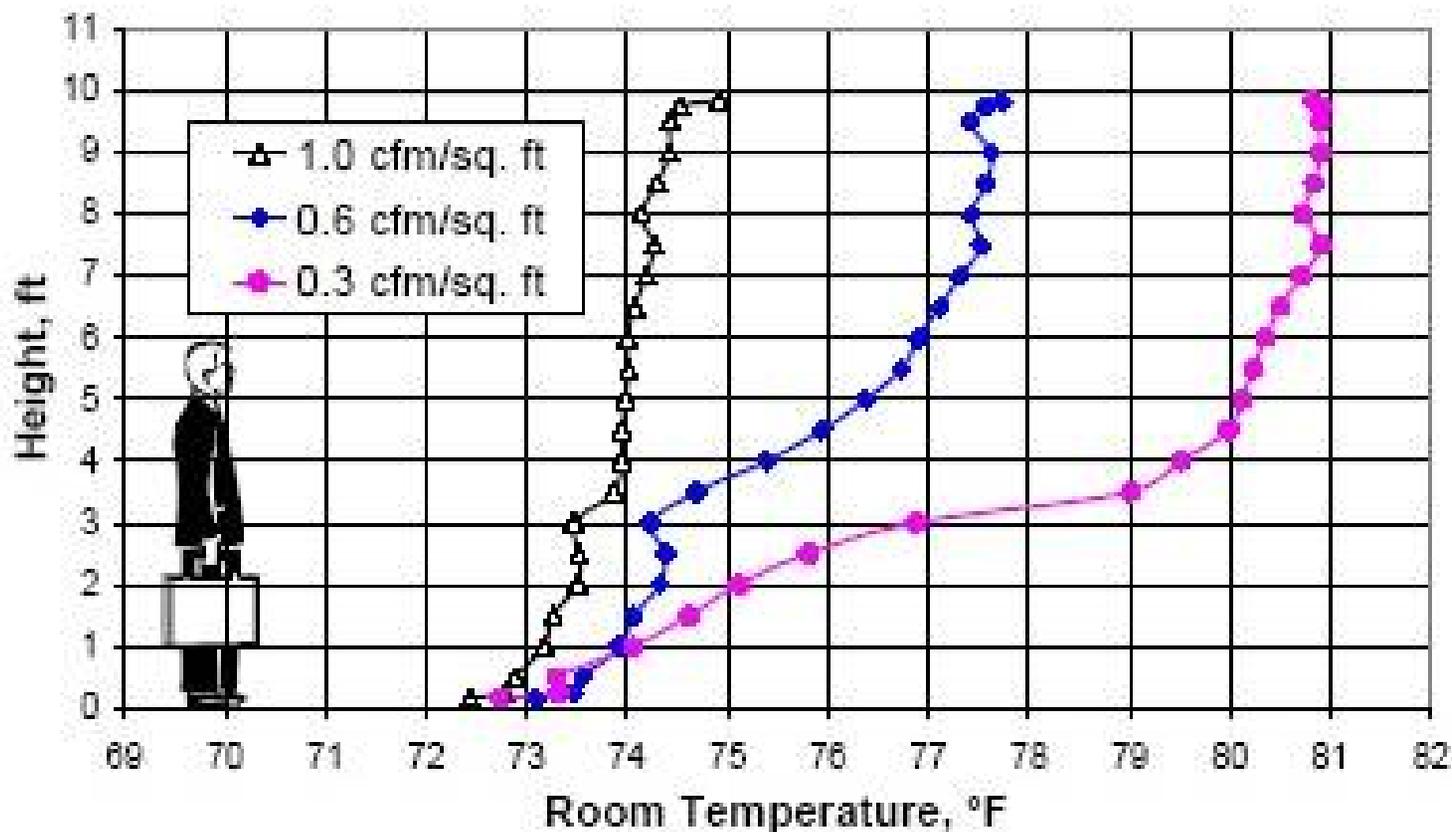
NY Times – Stub Ducts – Full Flow



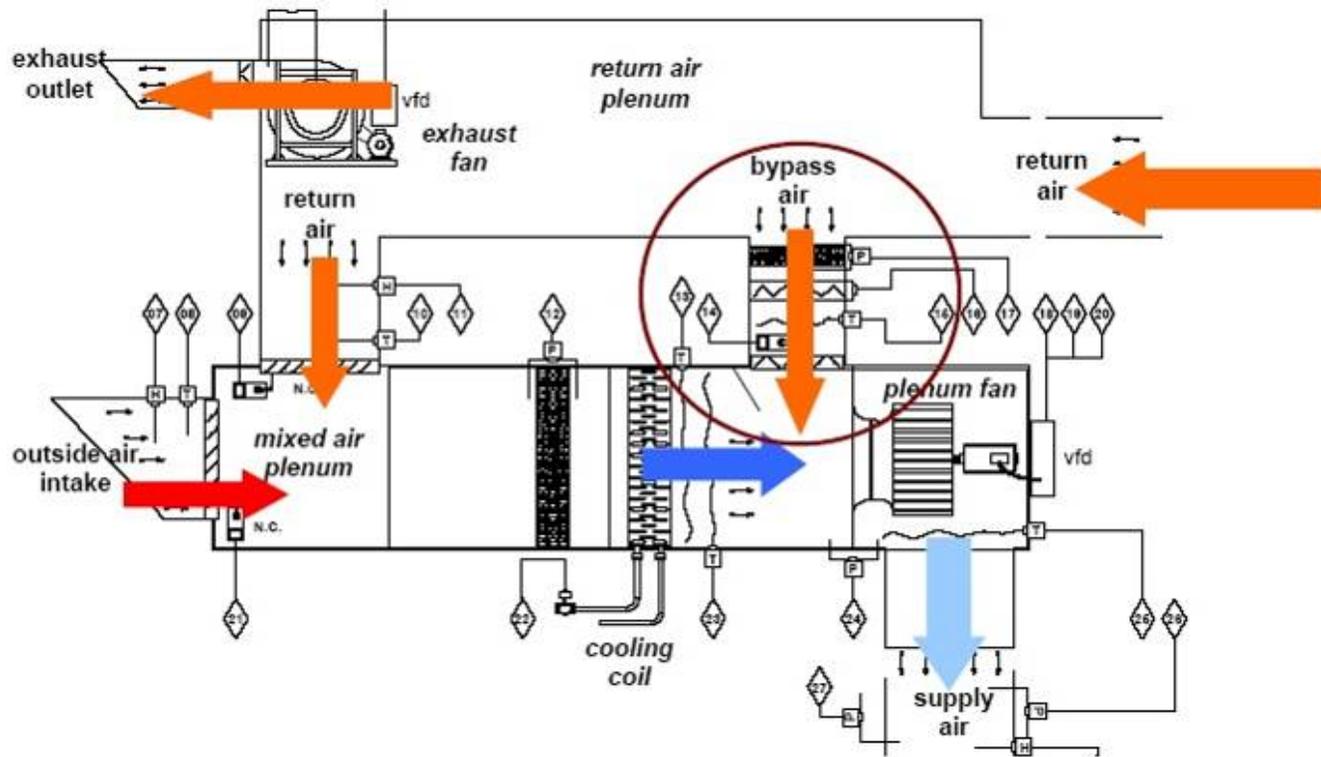
NY Times – No Stub Ducts – Full Flow



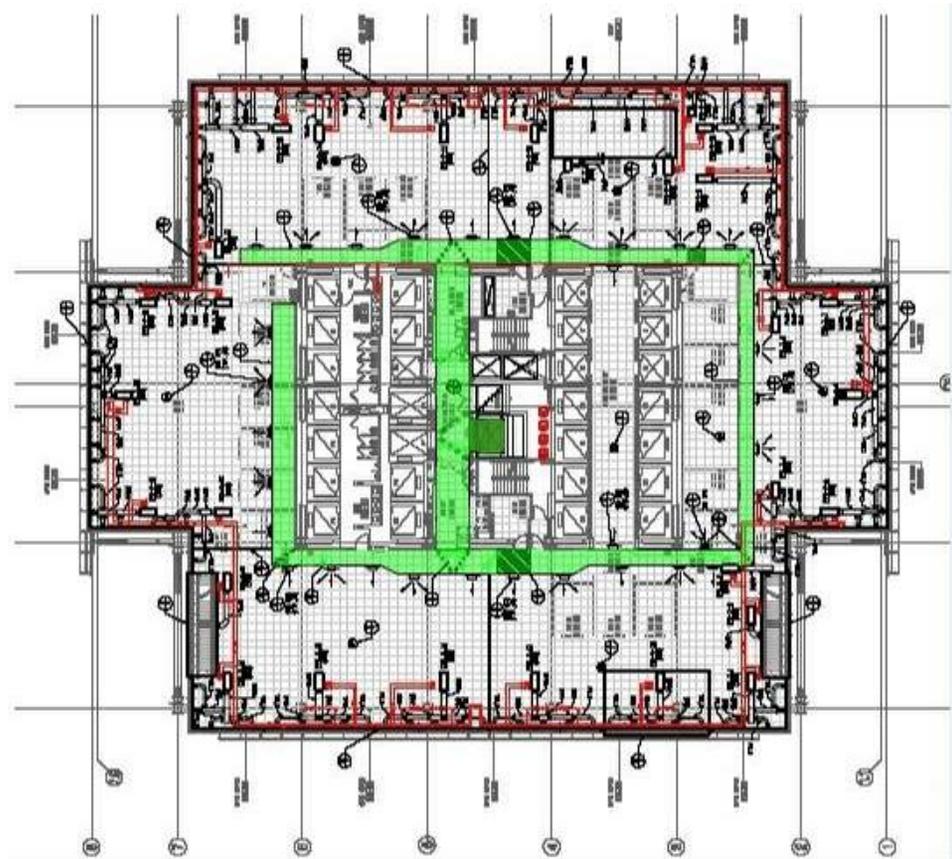
Ratio of Supply Air Flow to Load



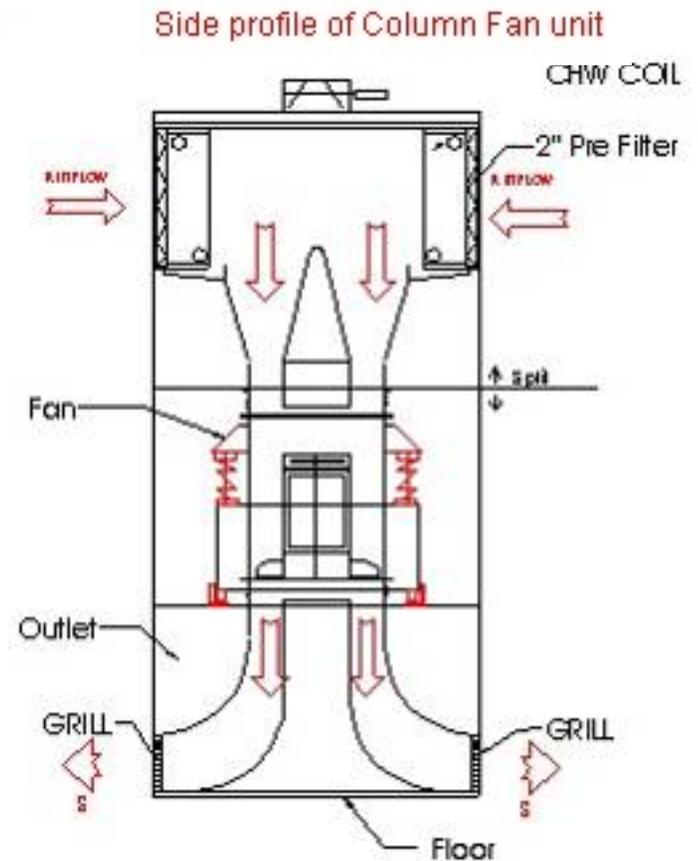
Humidity Control - Central Station Bypass Air Handling Units



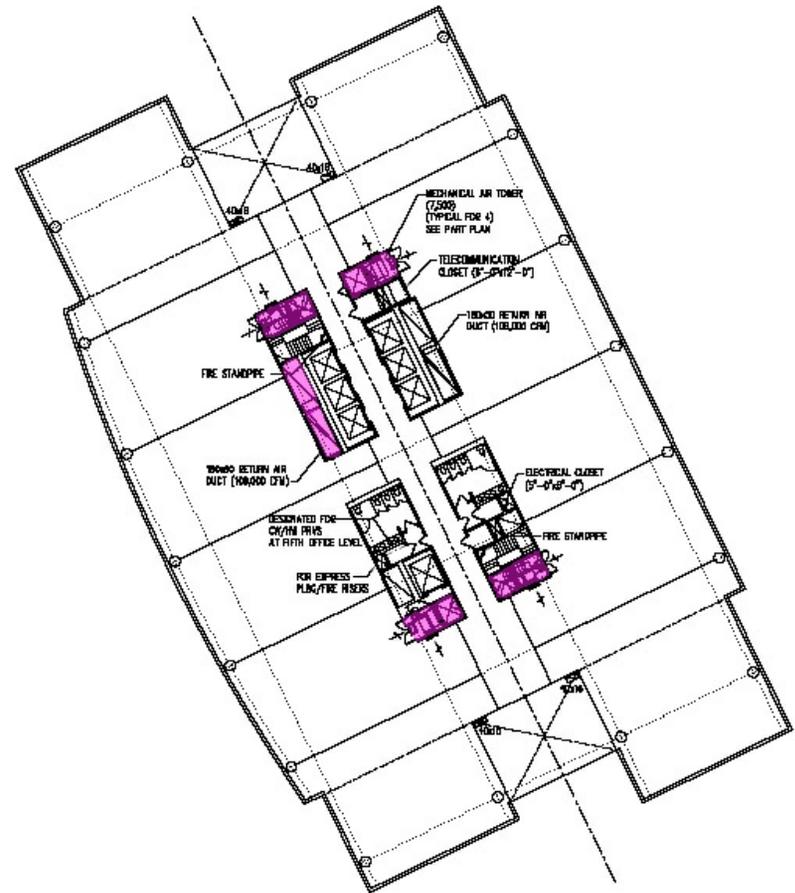
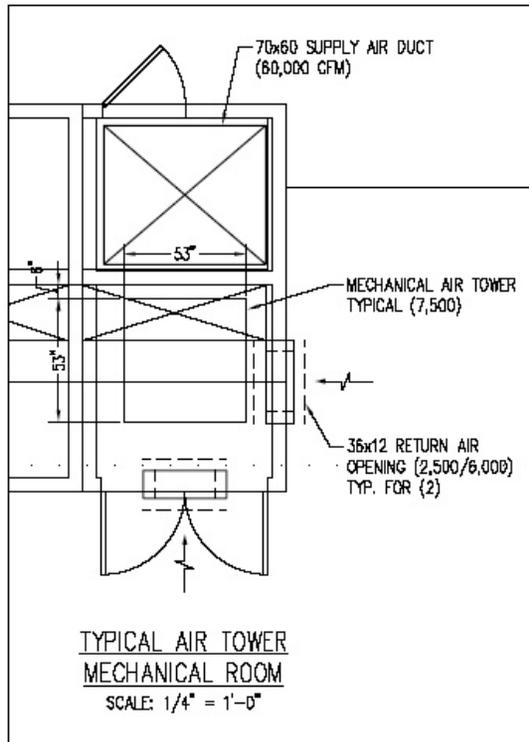
NY Times Plan with Underfloor Air Highways



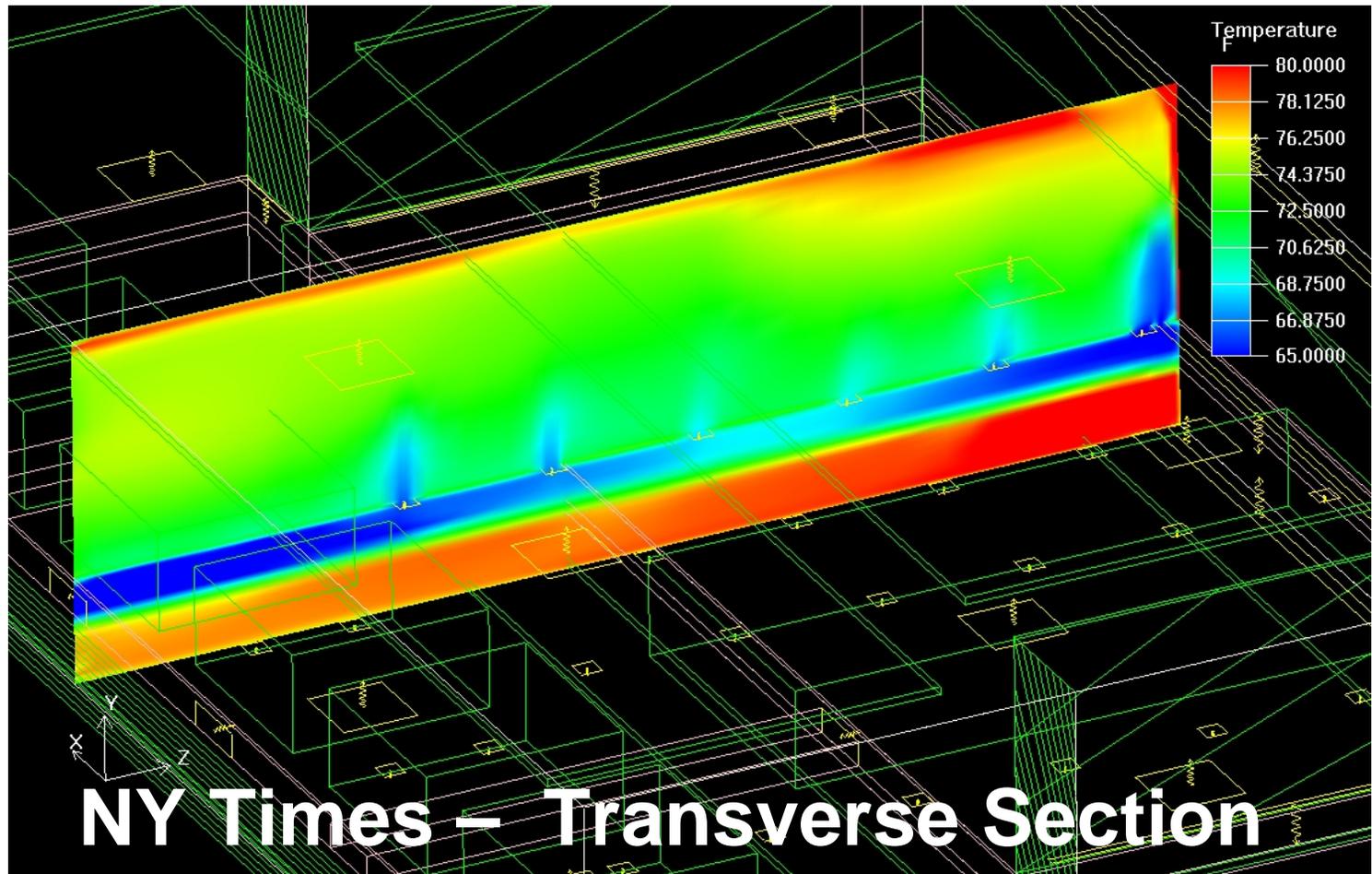
Humidity control - Air Towers



Air Tower Space Usage



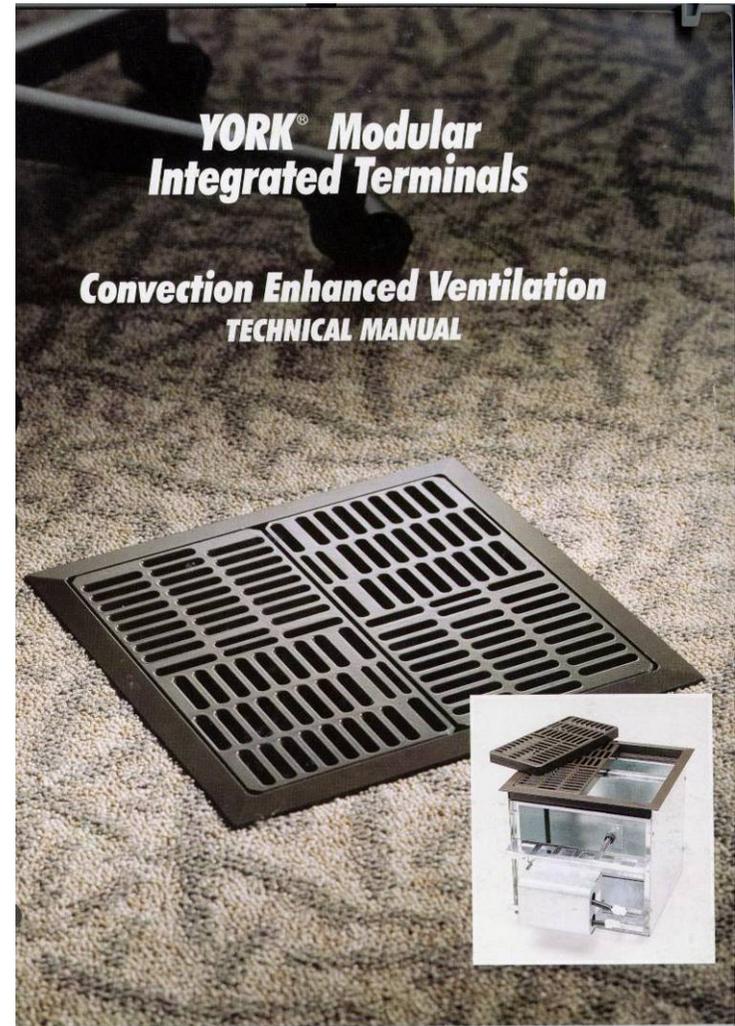
Concentration of Heat Gains



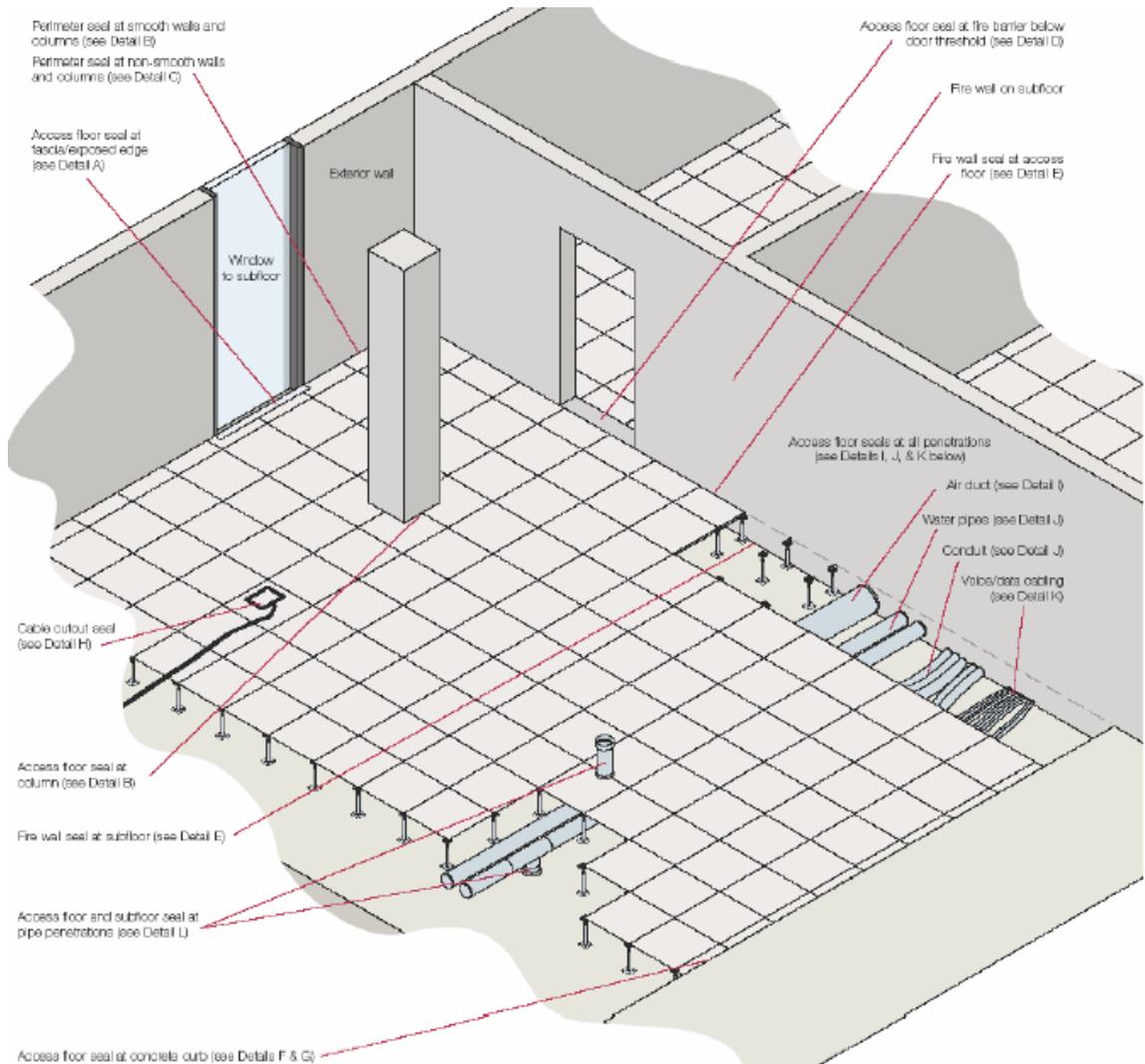
Floor Displacement Diffuser



Floor Variable Volume Terminal and Diffuser



Plenum Leakage Control

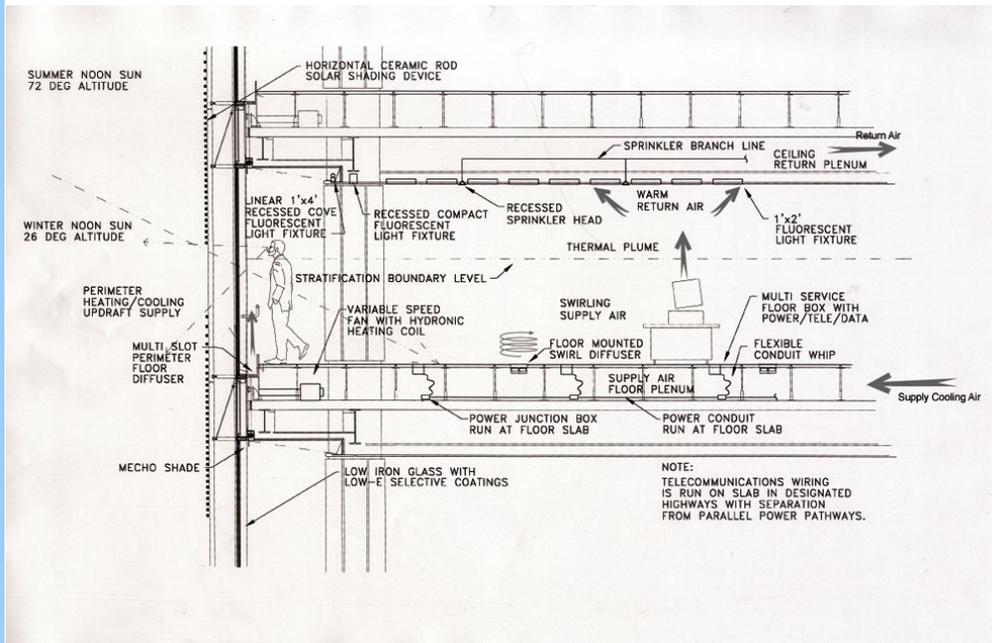


Alcoa Corporate Headquarters

Pittsburgh, PA



NY Times Corporate Headquarters



Thanks

**Daniel H. Nall, FAIA, PE
Flack + Kurtz, Inc.
475 Fifth Avenue
New York, NY 10017
Daniel.Nall@ny.fk.com
212 951 2691**

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