

Healthy Learning Classrooms

with
Access Floors &
Underfloor HVAC



HIGH PERFORMANCE
EDUCATION BUILDINGS

Tate®
ACCESS FLOORS



LEED™ Driven



The Facts: Our schools have Indoor Air Quality

Of the 115,000 schools in the U.S., the average age is 42 years. Fifty percent of these facilities have problems linked to poor indoor air quality, which has an adverse effect on student health, performance and test scores. Staff members also cite inferior indoor air quality as a major factor for low morale, poor performance, high absenteeism and health problems.

According to the U.S. Environmental Protection Agency (EPA):

- Before graduation, a typical child will have spent **14,000 hours** breathing school air
- **50%** of schools have **problems linked to poor indoor air quality**
- Some conditions, including indoor air in the school environment, are closely associated with Sick Building Syndrome and asthma
- **Asthma** is the **leading cause of school absenteeism**, accounting for **10 million** missed school days each year
- Between 1982 and 1992, asthma cases in the US **increased by 49%**
- **At least 20%** of students suffer from **allergies** or **asthma**
- Hazardous air **adversely effects** student performance, test scores
- Education facilities must **legally** provide a **'reasonable standard of care'**
- Any facility failing to meet this standard could be deemed **'negligent'**
- **1 in 5** Americans spend time in schools each day

School staff members report:

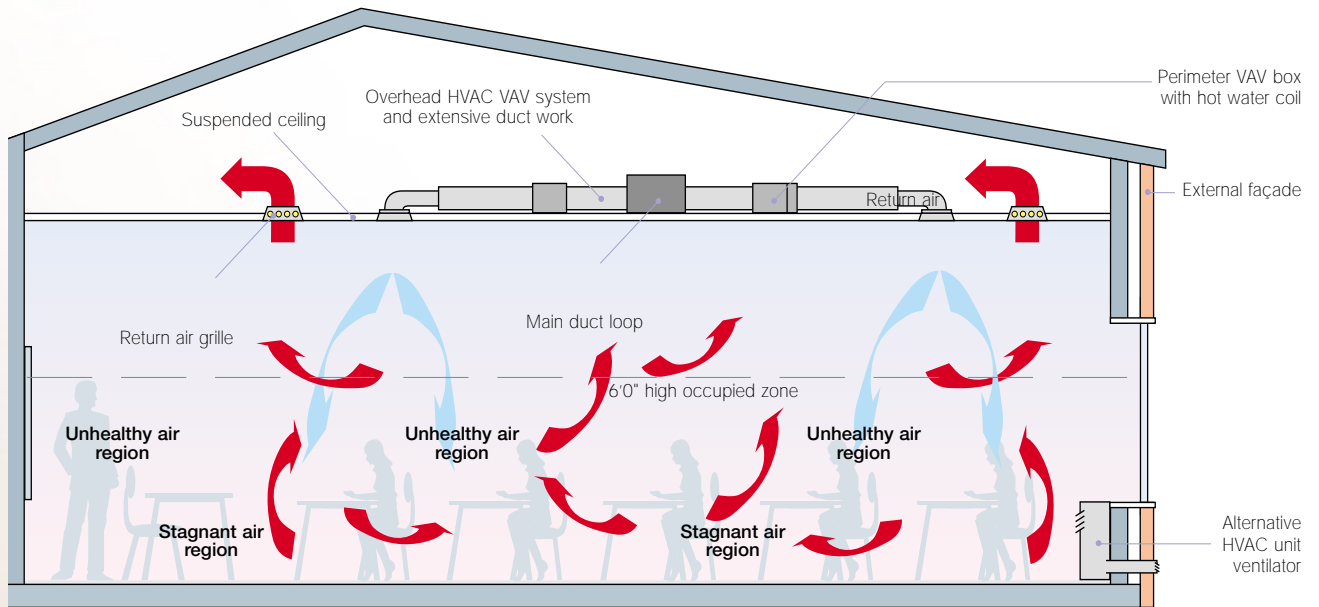
- Headaches, dizziness and nausea
- Irritation of eyes, nose or throat
- Dry cough/respiratory irritation
- Dry or itchy skin
- Concentration difficulty and/or fatigue
- Dehydration

This information is often sufficient to demonstrate a failure to provide a 'reasonable standard of care' and can create potential liability problems.

... Students in schools in poor condition had achievement that was 6% below schools in adequate condition and 11% below schools in excellent condition. (Edwards, 1999)

Air Quality Problems

Typical Classroom Layout – Overhead (VAV) or Unit Ventilator HVAC System

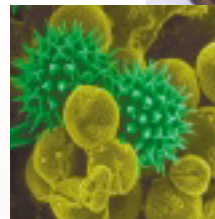


High humidity, poor air filtration and/or inadequate air circulation can cause:

- Dizziness or nausea
- Dehydration
- Mold and mildew formation

Reports show:

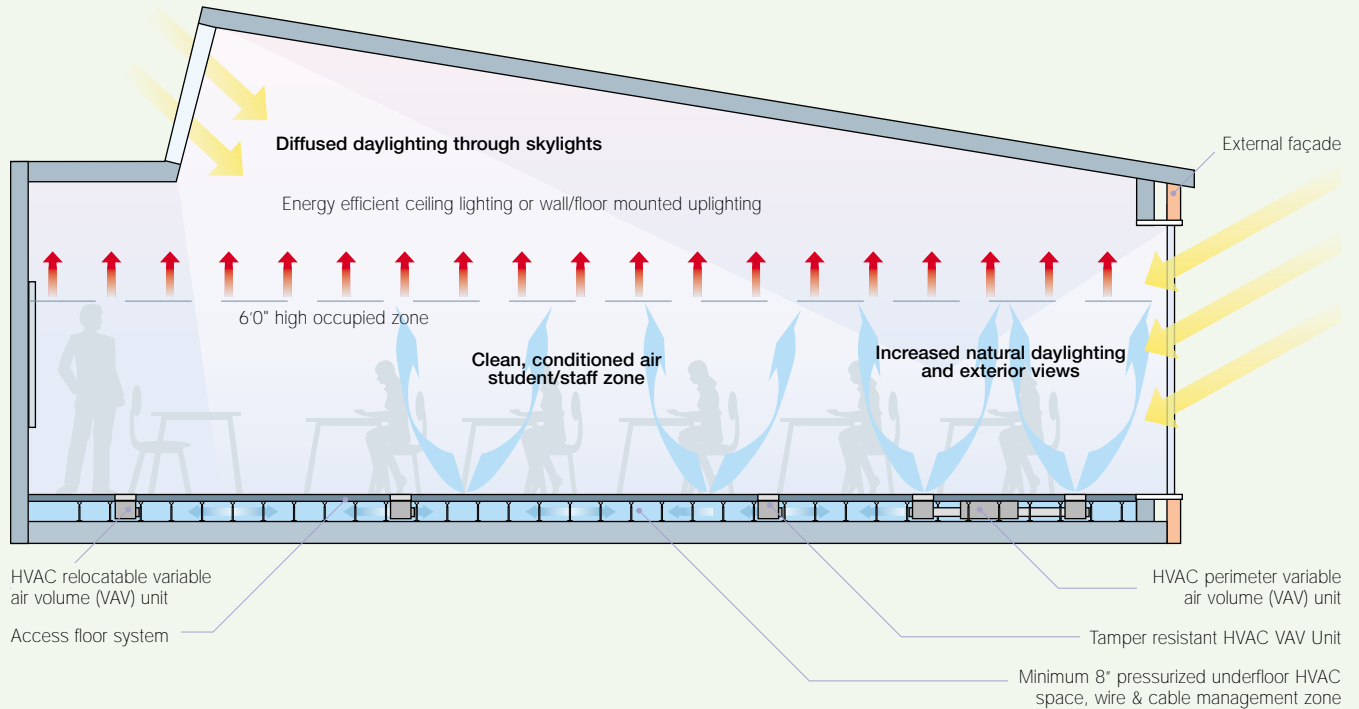
- A growing body of evidence links student performance and indoor environment conditions
- Poor natural and artificial daylighting reduces student learning by up to 20% on math tests and up to 26% on reading tests (*Heschong Mahone Group, 1999*)
- Poor indoor air quality can reduce average daily attendance, which reduces operating budget if based on daily attendance records
- Higher energy consumption and operating costs result when HVAC system is **not** designed for optimum efficiency
- Technology additions or changes are disruptive or expensive when service distribution system is **not** designed to accommodate change



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(91)

The Tate Education Technology Platform™ = Healthy Learning

High Performance Classroom Layout with Underfloor HVAC and Services



The Education Technology Platform™ classroom provides healthy learning space through an integrated ‘whole building’ approach:

- **Healthy, fresh, clean indoor air quality** benefits student/staff health and comfort
- **Superior indoor air quality** maximizes student academic performance
- **Staff productivity improves** through enhanced classroom environment
- Individual comfort, temperature and learning environment is enhanced
- Attendance of students and staff improves
- **Significantly increased natural daylighting** levels combined with artificial uplighting reduces glare and permits **faster** student learning
- Space **flexibility, connectivity** and adaptability with access floors, modular underfloor HVAC and plug and play services facilitate rapid space layout or use changes
- High performance and sustainable design solutions and materials contribute to LEED™ Certification
- Superior HVAC acoustics improve learning environment
- HVAC energy consumption is up to **20% lower**
- **Technology assisted learning** is enabled
- Prefabricated engineered plug and play service distribution solution provides speed of construction and lower overall cost



Red Rocks Community College



Quality Problems



Indoor air is 2 to 5 times more polluted than outdoor air. In some cases this can be 100 times more polluted.

Common pollutants/particulates in indoor air include:

- Outdoor air pollutants and pollens
- Radon fumes and emissions
- Allergens from classroom animals and pests
- Chemical pollutants from science and art classes
- Chemical pollutants from building maintenance

// Children breathe a greater volume of air relative to their body weights than do adults. Many children breathe through their mouths, bypassing the nasal passages' natural defenses //

The Tate Education Technology Platform

Healthy Learn



YORK® FlexSys™ VAV MIT-C terminals

Tate PosiLock™ understructure

*YORK® Underfloor VAV HVAC systems are an integral component of the **Tate Education Technology Platform™***

Healthy, Fresh, Clean Indoor Air!

Authorities, Staff and Student benefits

- **Enable** Federal, State, County and School Boards to provide a **'reasonable standard of care'** within Educational Facilities
- **Remove** 'hazardous' air quality risk, creating a **healthy** and optimum learning environment
- **Maximize** student performance, test scores, grades and future career potential
- **Reduce** risk of asthma attacks due to poor indoor air quality
- **Avoid** concentration difficulty and fatigue
- **Increase** staff productivity
- **Reduce** legal liability exposure
- **Reduce** risk of Sick Building Syndrome (SBS) due to **superior quality** underfloor air

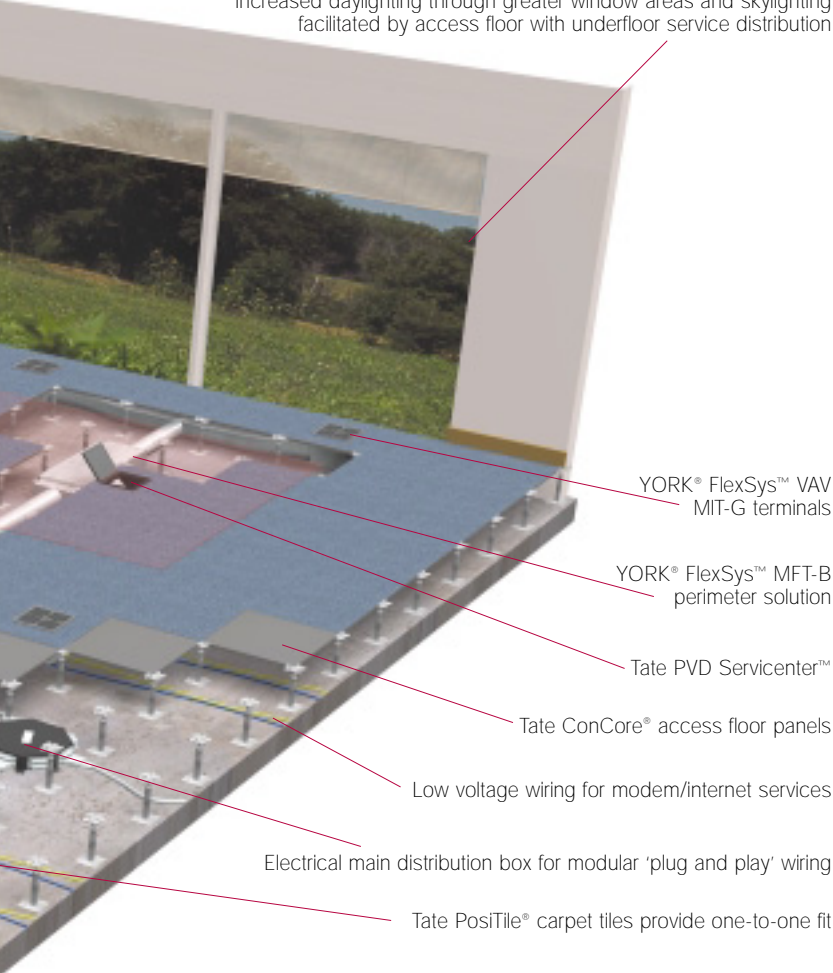
Cheaper to build!

Federal, State and County first construction cost benefits

- **Reduce** HVAC plant costs by up to **10%**
- **Reduce** power, voice and data cabling costs by up to **35%**
- **Achieve up to 15% faster** construction and completion time
- **Avoid** building obsolescence, 'future-proof' space adapts to any future technology changes and staff/student needs

rm™ ing Classroom space solution

Increased daylighting through greater window areas and skylighting facilitated by access floor with underfloor service distribution



YORK® FlexSys™ VAV
MIT-G terminals

YORK® FlexSys™ MFT-B
perimeter solution

Tate PVD Servicenter™

Tate ConCore® access floor panels

Low voltage wiring for modem/internet services

Electrical main distribution box for modular 'plug and play' wiring

Tate PosiTile® carpet tiles provide one-to-one fit

// Good indoor air quality contributes to a favorable learning environment for students, performance of staff, and a sense of comfort, health and well being. These elements combine to assist a school in its core mission – educating children //

United States Environmental Protection Agency (EPA)

Cheaper to operate!

Federal, State and County benefits

- **Reduce** lifecycle ownership costs
- **Reduce energy** consumption and costs by up to **20%** per year
- **Reduce fan energy** usage by **32-48%** per year
- **Reduce cooling energy** consumption by up to **15%** per year
- **Allow rapid** space reconfiguration at **low cost**
- **Reduce** wiring and cable reconfiguration costs by up to **85%**
- **Reduce HVAC** maintenance costs by up to **20%** per year
- **Increase** staff satisfaction and retention and **reduce** staff absenteeism
- **Reduce** costs of substitute teachers covering for absent staff

Sustainability & Green Issues

Federal, State and County environmental and economic benefits

- High performance innovative design
- Reduced energy consumption and operating costs
- Thermal comfort control
- Individual airflow control
- Improved ventilation effectiveness
- Improved indoor environment through increased daylighting and views
- Recycled content
- Building reuse (renovation of existing structure)
- Use of low emitting materials



LEED™ Driven



Gain the advantages of a healthy class with underfloor

Inferior Indoor Air Quality Systems

Overhead VAV HVAC

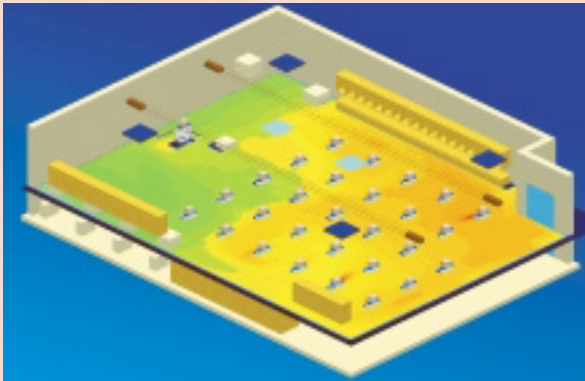


Vertical Temperature Profile

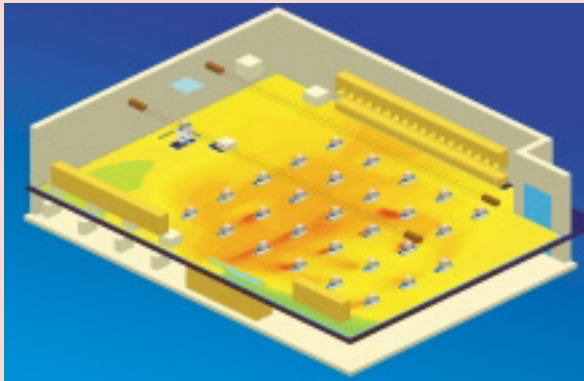
Unit ventilator HVAC



Vertical Temperature Profile



Horizontal Carbon Dioxide Profile – 3 ft. Elevation



Horizontal Carbon Dioxide Profile – 3 ft. Elevation



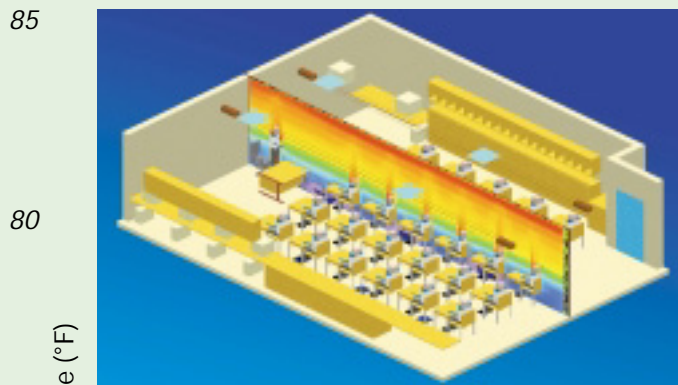
Overhead, Underfloor, and Unit Ventilator Air Distribution Systems were all analyzed for vertical and horizontal temperature and carbon dioxide profiles using a CFD (Computational Fluid Dynamic) design program. Results show the clear benefit of using Underfloor Air distribution to both reduce energy through thermal stratification and improve air quality in the occupied 'breathing' zone.

The above computational fluid dynamic images are a well documented methodology for comparing indoor air quality levels. Source: Healthy Buildings International (HBI) and Malone Engineering.

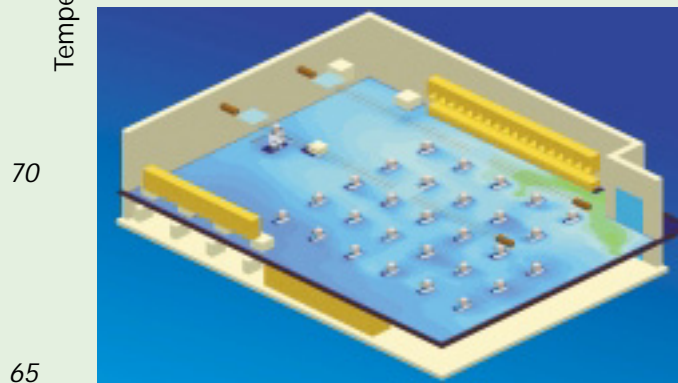
room

air systems

Healthy Indoor Air Quality Systems Underfloor HVAC



Vertical Temperature Profile



Horizontal Carbon Dioxide Profile – 3 ft. Elevation

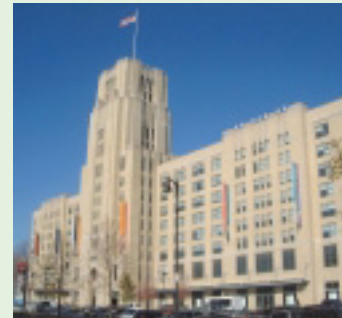
// We didn't want a Sick Building. We wanted to create an example of a future-proof, sustainable, valuable shared space //

John Spengler PhD, Department of Environmental Health, Harvard School of Public Health

Underfloor Air Advantages

- **Superior Indoor Air Quality**

Underfloor HVAC provides fresh, clean and healthy air which is always in student and staff breathing zone, with very little mixing and inefficiency. Stale air exits the room through the ceiling or wall returns. Students and teachers get first pass benefit of healthy, clean, fresh air and germ and pollutant spread is minimized.



Harvard School of Public Health, Boston, MA

- **Low-Cost and Simple**

Underfloor HVAC cuts costs for other building components, such as HVAC equipment and drop ceilings, and saves on first construction costs. There is no costly ductwork to dismantle, discard, or replace during reconfiguration.

- **Flexible and Technology-Ready**

Move, expand or reconfigure classroom space easily and at lower cost. Air outlets are easily relocated with minimum disruption, and without special maintenance technicians.

// Underfloor air distribution, used in the Tate Education Technology Platform™, provides a healthy learning environment and has been widely accepted in schools //



LEED™ Driven



The Tate Education Technology Platform technology en



Underfloor Plug & Play wire and cable system

- Facilitates the installation of 'technology enabled learning' methods
- Adaptability – underfloor plug & play, power, voice and data systems offer unlimited zone connectivity.
- Flexibility – allows rapid space reconfiguration and multi-purpose use
- Reduces wire and cable reconfiguration costs by up to 85%

Technology enabled student workstations with internet access and other networking capabilities

Tate PosiLock™ understructure

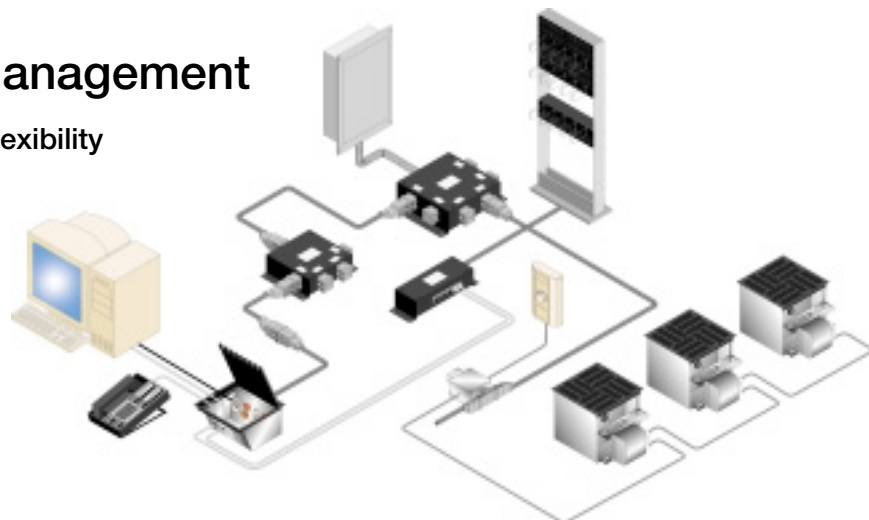
The Tate Education Technology Platform™ is also suitable for education facility modernization applications

Power, Voice and Data Management

Underfloor Voice and Data Plug & Play Flexibility

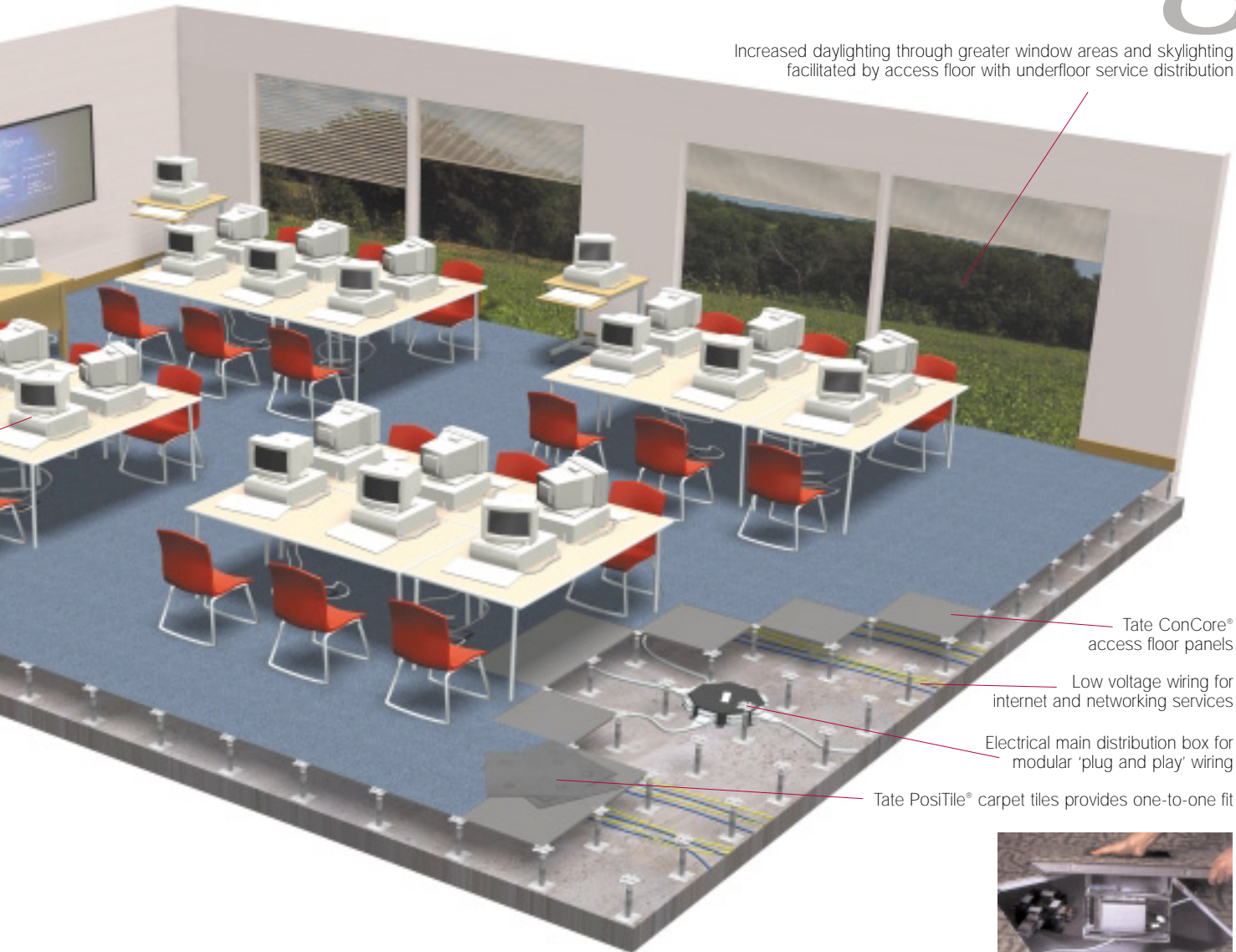
The modular wiring concept provides a means of connecting power and telecom/data services to each workstation via Tate PVD Servicenters™.

Each integrated system is engineered for fast, easy installation, and quick cable changes. Space can be reconfigured without disrupting critical power, voice and data services.



room™ provides integrated enabled learning

Increased daylighting through greater window areas and skylighting facilitated by access floor with underfloor service distribution



Tate ConCore® access floor panels

Low voltage wiring for internet and networking services

Electrical main distribution box for modular 'plug and play' wiring

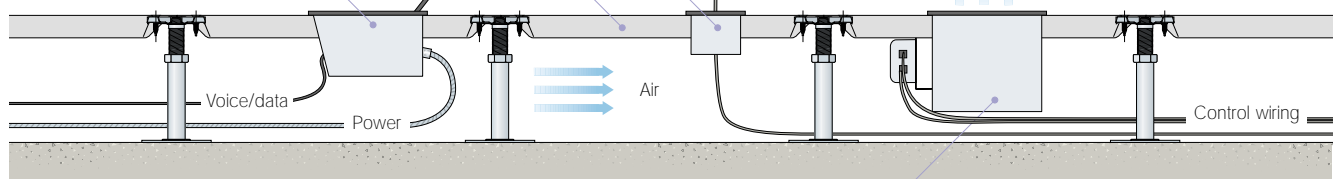
Tate PosiTile® carpet tiles provides one-to-one fit



Pass-thru services

Access floor

Modular and relocatable PVD Servicenter™ floor termination wire and cable



Modular and relocatable HVAC diffusers (optional)



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Technology Ready Solutions support higher learning

Re-engineering the Classroom

In *The National Educational Technology Plan* the U.S. Department of Education defines imperatives to improve teaching and learning through technology.

Based on the knowledge that information technology is *essential* in classrooms, schools, communities and homes, the goals emphasize the need for continuing research and use of digital content and networked applications to achieve the desired transformations in education.

The report further notes that simply providing the tools of technology, i.e. wider bandwidth networks, internet connectivity, is *only the first step toward meeting these challenges*.

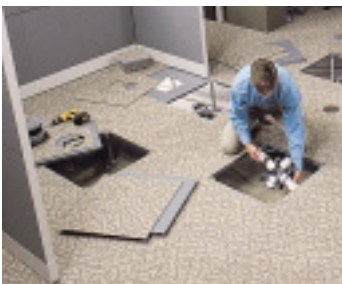
Re-engineering the environment in which learning occurs is also necessary

The individual classroom must become a multi-purpose, multi-media environment that reflects fundamental change in education approaches and techniques.

Tate Education Technology Platform™

Effective classrooms require a reconfigurable and accessible service distribution

system. Access floors with modular 'plug and play' wiring and underfloor HVAC provide the necessary infrastructure to support this strategy.



Flexible, innovative interior space means...



Photo courtesy of United Visual, Inc.

Effective Teaching Methods

The classroom infrastructure is designed to support a variety of resources that enable both individual and group interaction.

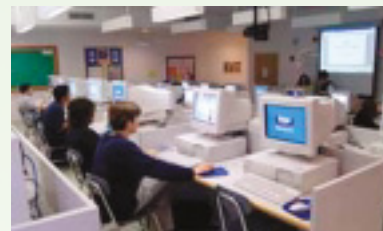


Photo courtesy of United Visual, Inc.

Multi-Function Classrooms

To maximize the return on investment, the classroom is designed for learning a range of subjects, from arts to science, with technology to support the process.

g opportunities

easier access to technology...



Photo courtesy of United Visual, Inc.

Individual Computer Access

Through interactive education software, students learn first-hand, at their own pace as opposed to the traditional lecture method.

Internet Ready Facilities

Communication between classrooms in different cities, regions, and throughout the world, and access to the internet yields tremendous opportunities for learning.

accommodation of varied activities...

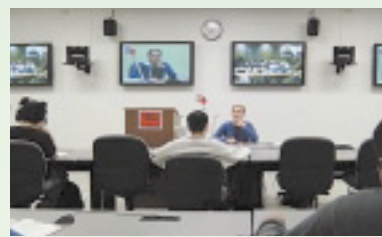


Photo courtesy of United Visual, Inc.

Shared Distance Learning

Classrooms support distance learning programs providing powerful, interactive learning environments.

with no rigid barriers between grades.



// Education facilities designed with the Tate Education Technology Platform™ stimulate students to reach their full learning potential //

The Tate Education Technology Platform green building

Tate Access Floors, Inc. is committed to providing innovative, integrated, high-performance, and cost-effective service distribution solutions.

Tate is a member of the U.S. Green Building Council, and supports the goals of creating a healthy environment, and practicing environmental responsibility in a cost-effective and energy efficient manner.



LEED™ Green Building Rating System

The U.S. Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED™) program defines high performance design, construction and operation guidelines and awards credits for meeting these standards.

The four levels of LEED™ Certification are:

- **LEED™ Certified** 26-32 points
- **Silver** 33-38 points
- **Gold** 39-51 points
- **Platinum** 52-69 points

*The Tate Education Technology Platform™ contributes significantly to gaining LEED™ points, and affects three of the five credit categories.**

Advantages

- **Healthy, fresh, clean indoor air quality:** Increases student learning/grades and staff productivity/retention
- **Better student/staff health:** Reduces absenteeism by up to 30%
- Individualized personal comfort control
- **Energy efficiency:** Reduces HVAC chiller size by up to 10% and cooling energy consumption by up to 20%

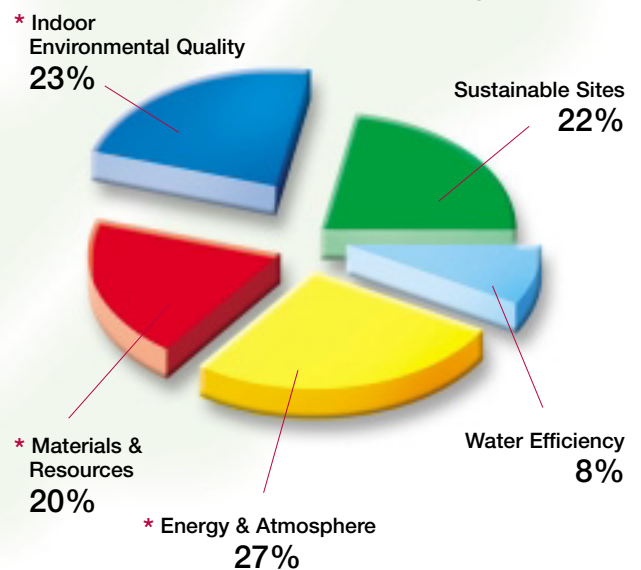
LEED™ Environmental Goals and Credit System

- Sustainable Sites 14
- Water Efficiency 5
- Energy & Atmosphere* 17
- Materials & Resources* 15
- Indoor Environmental Quality* 13

Core Credits	64
Innovation Credits	4
Design Process Credits	1

Total Possible Credits 69

Five LEED™ Credit Categories



ing solutions

for Education Facilities

Testimonials

Walter Payton College Prep High School
Chicago, Illinois

"...the school put down easy access flooring throughout the building... no one is going to be punching holes in walls or tearing up tiles to make this school internet ready"

Liberty View Elementary School
Overland Park, Kansas

"...the building environment felt so good that we looked around to see if the windows were open"

Harvard School of Public Health
Boston, Massachusetts

"...not only an advanced technical office but a real life living laboratory"

Projects: Education Facility Buildings

Steelcase Corporate Learning & Design Center

Grand Rapids, MI
45,700 ft²

Blue Valley Elementary School #20

Overland Park, KS
78,000 ft²

Hershey Medical Center EAB Building

Hershey, PA
120,000 ft²

Priest Elementary School (Workstage)

Detroit, MI
40,000 ft²

Columbian Primary School (Workstage)

Detroit, MI
40,000 ft²

Marquette Elementary School (Workstage)

Detroit, MI
40,000 ft²

Golightly Educational Center (Workstage)

Detroit, MI
40,000 ft²

Greenfield Union Elementary School (Workstage)

Detroit, MI
40,000 ft²

Emerson Elementary School (Workstage)

Detroit, MI
40,000 ft²

Walter Payton College Prep High School

Chicago, IL
57,400 ft²
(of 162,500 ft² 3-story building)

Cayahoga Community College – West Campus

Cleveland, OH
30,000 ft²

Salt Lake City Public Library

Salt Lake City, UT
150,000 ft²

Massachusetts Institute of Technology Stata Center

Boston, MA
249,500 ft²

University of Toronto

Toronto, ON, Canada
240,000 ft²



Liberty View Elementary School



Walter Payton College Prep High School



Tate's High Performance, Green and Sustainable Building Solutions brochure is available at www.tateaccessfloors.com



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ACCESS FLOORS

Tate Education Technology Platform™

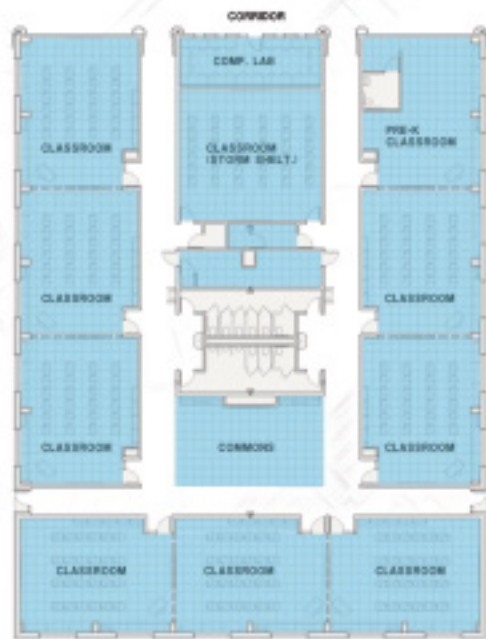
Liberty Vi



2 SECTION THREE CORRIDOR & ACTIVITIES MODULES LOOKING NORTH



3 SECTION THREE CORRIDOR & TYPICAL CLASSROOM MODULES



“The building environment felt so good we looked around to see if the windows were open”

Project details

- Project cost – **\$8.9 million**
- Floor area – **78,000 SF**
- Interior solution – Access floors, integrated underfloor HVAC, wire and cable management



Client: **Blue Valley Schools, Olathe, Kansas**

Architect: **Horst, Terrill & Karst, Overland Park, Kansas**

MEP Engineer: **Larson Binkley, Inc., Leawood, Kansas**

“Feels as fresh indoors as it does outdoors”

- Case Studies

eW Elementary School, Overland Park, KS

// We are very impressed with the flexibility of the electrical and HVAC infrastructure //



Proposed Cost Comparison – Overhead VAV Dual Duct vs FlexSys™ Underfloor VAV System

Values were calculated on 55,800 sq.ft.
(Athletic/Kitchen wing not included).

	Overhead VAV Dual Duct	YORK® International FlexSys™ Underfloor VAV System	SAVINGS
AHU 1,2,3	\$44,000	\$44,000	
Labor @ \$5,000 each AHU	\$15,000	\$15,000	
Boilers 1,2,3, installed	\$75,000	\$75,000	
Chillers, air cooled scroll	\$94,824	\$94,824	
Sheet Metal - dual duct system (\$7.15/sq ft)	\$399,000	\$60,000	\$339,000
MIT / MFT w/controls and floor grilles installed	- - - -	\$118,955	(\$118,955)
DDC Controls (52 dual duct units)	\$30,200	- - - -	\$30,200
Test & Balance	\$40,000	\$10,000	\$30,000
Tate floor (38,000 sq ft)	- - - -	\$202,650	(\$202,650)
Electrical: Floor receptical, wire, & cable	- - - -	\$10,200	(\$10,200)
Electrical: Wall receptical, wire, & cable	\$66,629	\$39,978	\$26,651
Electrical: Labor	\$179,854	\$119,783	\$60,071
G.C. cost for electrical	\$50,000	- - - -	\$50,000
G.C. cost for AS IS walls & penthouse	\$194,921	- - - -	\$194,921
G.C. cost for proposed low walls & basement	- - - -	\$147,765	(\$147,765)
Data Cable installed classrooms (150 drops)	\$30,000	\$17,000	\$13,000
Hot Water System/ w/labor	- - - -	\$30,000	(\$30,000)
	\$1,219,428	\$985,155	\$234,273

Operating Savings:

1. 65° Air Temp = 17% to 30% chiller savings	(CMR) 6% Job Expense	\$14,056
2. Proposed ASHRAE 62 Ventilation Effectiveness: Ve = 1.2 vs 0.8	(CMR) 7% Overhead	\$16,399
	(CMR) 8% Profit	\$18,742

First Cost savings:

\$283,471

Predicted Annual operating cost: HVAC

\$43,500 \$30,451

\$13,049

The above proposed cost comparison is based upon this project. Courtesy of Larson Binkley, Inc., Leawood, Kansas.



YORK® FlexSys™



LEED™ Driven

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Tate Education Technology Platform™

Detroit Public Schools



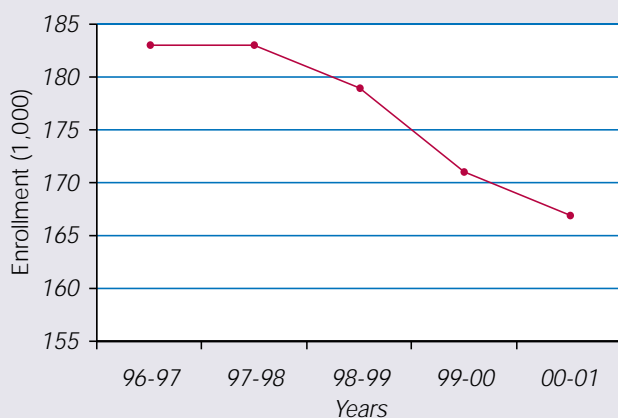
“We thought about the future of your child”

Workstage, 2002

Project goals

Existing buildings' infrastructures failed to meet current requirements. Rising maintenance and fixed costs, poor IAQ, and years of declining enrollment (*see chart*) prompted the need to re-invigorate the community and increase the quality of education.

Declining enrollment



A sustainable, economical approach was needed to meet a stringent construction schedule of building six schools within eight months (traditionally requires thirty months).

Six newly constructed schools:

- Priest Elementary School
- Columbian Primary School
- Marquette Elementary School
- Golightly Educational Center
- Greenfield Union Elementary School
- Emerson Elementary School
- Build method – **Pre-engineered integrated system**
- Interior solution – Access floors, integrated underfloor HVAC, wire and cable management
- Floor area – **approximately 40,000 SF each**

Client: **Detroit Public Schools**

Architect: **URS**

Construction System & General Contractor:

Workstage, Grand Rapids, MI

“We have designed this building to be healthy”

Workstage, 2002

- Case Studies

ic Schools

Detroit, MI



“A child’s health is a concern to any parent or teacher”

Workstage, 2002



“We strongly believe in connecting your child with the outdoors”

Workstage, 2002

Tate Education Technology Platform™ – Flexible and changeable infrastructure



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Tate Education Technology Platform™ Red Rocks Co



Project details

- Floor area – **20,000 SF**
- Interior solution – Access floors, integrated underfloor wire and cable management

Client: **Red Rocks Community College, Arvada, CO**

Architect: **Davis Partnership, Denver, CO**

General Contractor: **Gerald H. Phipps, Denver, CO**

// The more we played with the building plans, the more sense access flooring made //

*Denise Tatnall, Project Manager, Administrative Services,
Red Rocks Community College*

Smart Classrooms

The 20,000 square foot Technology Center includes state-of-the-art 'smart' classrooms and a Learning and Resource Center (LaRC). At the heart of the Technology Center is the telecommunications and equipment room where campus IT professionals control networking capabilities.

There are six 'smart' classrooms which provide Internet access for laptop computers, as well as two 24-station networked computer classrooms.



LaRC is the 6,000 square foot centerpiece of the Technology Center housing the computer commons, self-paced labs, telecourse and on-line course support, library services and career resources. The area also provides access to the internet.

Case Studies

community

College Arvada, CO

*// We move walls.
We remodel. Classrooms
get changed all of the time.
We wanted to build the
building so that when we do
make these changes, it is
easily resolved //*

Denise Tatnall

The primary design requirements of the new facility included:

- Accessibility for technology changes and updates
- Aesthetic appeal to teachers and students

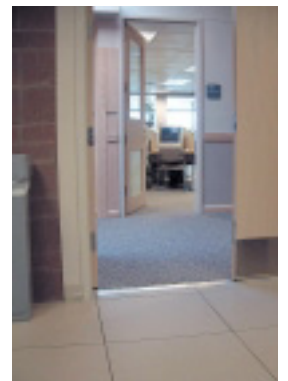
Modular electrical components meet the Arvada Technology Center's requirements including phone, data, video, and cable television capabilities. Used in conjunction with the access floor, staff and students' changing requirements are readily accommodated.

With Tate's raised floor, modular wiring and PosiTile® carpet, Red Rocks gained a beautiful environment for teachers, students and staff that also accommodates quick and inexpensive changes and updates.



Practical Solutions

In order to support technological functions for the educational and administrative areas, the Technology Center required a telecommunications and equipment room dedicated to Information Resource Management. Red Rocks utilizes an access floor system to accommodate massive telecom equipment, as well as maintain easy access to communications components for troubleshooting, maintenance, and upgrading.



LEARNING & RESOURCE CENTER



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Tate Education Technology Platform™

Walter Payton



Walter Payton College Prep High School is the second high school Chicago Public Schools officials have built from the ground up in the past 20 years. The school is a landmark, illustrating the reform of administration and teaching methods and providing a model for on-time, on-budget innovative school design and construction.

This leading edge structure contains 57,400 square feet of access flooring with floor-level electrical outlets, enabling any configuration of equipment and seating. Access floors were installed throughout the building, allowing cables and phone lines to be laid during construction.

When building service changes are required, the floor is easily opened to access the underfloor cabling.

Project details

- Floor area – **57,400 SF**
- Interior solution – Access floors, integrated underfloor wire and cable management

Client: **Chicago Public Schools, Chicago, IL**

Architect: **DeStefano & Partners, Chicago, IL**

General Contractor: **Michuda Construction, Inc., Chicago, IL**

Audio Visual Integrator: **United Visual, Inc., Itasca, IL**

// When changes are needed, the flooring is easily opened, granting access to the cables underneath //

Case Studies College

Prep High School Chicago, IL

Technology Enabled Classroom

This high school features the optimum technology, with LCD projectors, networked laptops for every student and media retrieval in every classroom. Every desk in the school is a 'smart desk' with dual computer connections, so every classroom is essentially a computer lab. All wiring and cabling is placed under an access floor for the ultimate in accessibility and flexibility needed to accommodate various learning environments.



Photo courtesy of United Visual, Inc.

Media Retrieval

A teacher can look up a catalogue of videos, schedule a video, whether it's on DVD, laserdisc or VHS, and set it all up right from his computer. The teacher then uses a classroom remote to turn on his LCD projector and operate any equipment in the control room.



Photo courtesy of United Visual, Inc.

// Providing the flexibility to reconfigure the Category 5 cabling was the primary reason for incorporating the access floor system //

Distance Learning

One of the most exciting features of the technology program is the distance learning classroom, which gives teachers and students the ability to study with other classes across the city or even around the world. In this room as many as thirty students can take part in a question and answer session with a teacher at another school, or a guest lecturer at a remote site. Eighteen schools in the Chicago public school system are capable of videoconferencing and can link their classrooms.

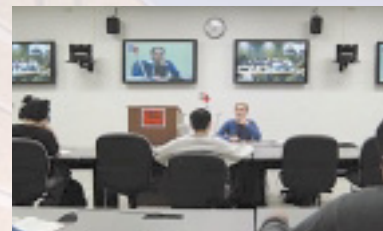


Photo courtesy of United Visual, Inc.



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The Tate Education Technology Platform modernization



Construction involved integrating original architectural features, such as columns, and modern technology requirements into an aesthetically pleasing, energy-efficient workspace



Harvard School of Public Health (HSPH) was founded in 1922 to advance public health through learning, discovery and communication. HSPH recognized the need for an environmentally economic and efficient workspace when designing new administrative offices in the historic Landmark Center in downtown Boston.

Client upgrade requirements

- High Performance facility, able to accommodate future technology requirements
- Environmentally responsible, sustainable Green Building, generating user health benefits and higher productivity
- Minimal disruption to occupants during construction

When the Harvard School of Public Health outgrew existing office space, they were faced with the challenges of transforming a warehouse into office space that reflected HSPH studies on the dramatic impact of indoor air and environmental quality on organizations and their employees.

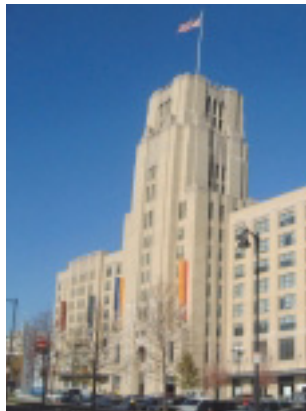
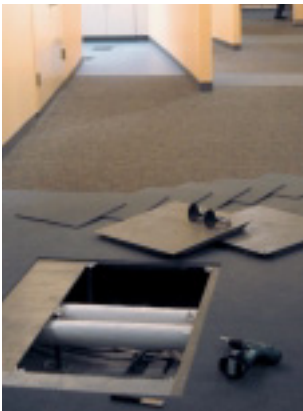


Use of underfloor building services allows larger windows, more creative use of overhead space for user-friendly, indirect ambient lighting

Findings that a 'green' approach results in a more comfortable, healthier and productive workforce, plus environmental and energy-saving aspects of 'clean construction' versus conventional methods were prime factors in planning the new HSPH facility.

rm™ - the ideal solution for n and upgrade

// Total project cost with an underfloor service distribution system was \$10 less per square foot than with conventional overhead systems //



All critical services are located underfloor to provide flexibility and accessibility

Tate's Education Technology Platform allows Harvard School of Public Health to:

- Develop a facility that is environmentally responsible and cost-effective, setting standards for new and renovated buildings
- Reduce cost of workspace reconfiguration
- Maintain a facility that can meet changing requirements
- Design office space with an integrated systems approach
- Increase overhead ceiling height for greater design options
- Enhance the work environment through improved Indoor Air Quality/Indoor Environmental Quality
- Re-use modular wiring, modular carpet, access floor panels and underfloor HVAC terminals

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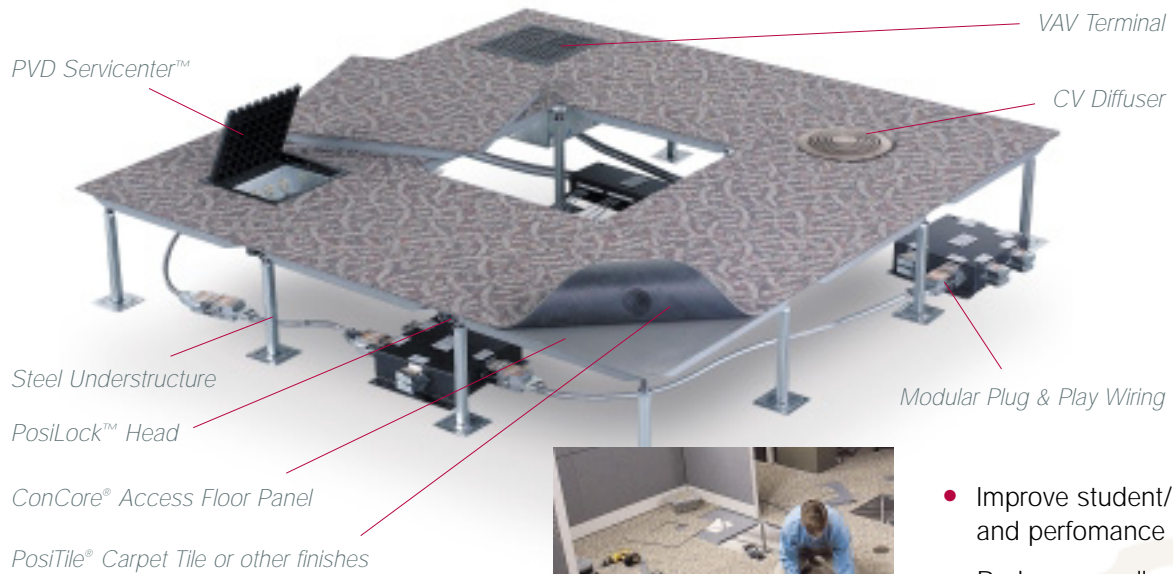
Tate's Architects Best Practice Design and Specification Guide is available at www.tateaccessfloors.com



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