



GLOBAL IFS®

Global Integrated Flooring Solutions is the leading provider of fully integrated, premium raised access flooring solutions for high-performing, state of the art environments in every building.

BENEFITS OF THE GLOBAL IFS SYSTEM

Deliver cleaner air

Healthier spaces

Precise temperature control

Reduced draft complaints

Flexibility for alternative floor plans

No unsightly wall and ceiling vents

Increased mechanical efficiency

UFAD should be a core component of any world-class building environment.

CASE STUDY Dynamic Systems Inc.





THE OPPORTUNITY AND CHALLENGE

Dynamic Systems Inc. (DSI), a mechanical and process construction firm, was in the process of designing their new fabrication and administration building in Buda, Texas. Based on their work with their own clients, DSI was already familiar with the benefits of underfloor air distribution (UFAD) systems, but the company was unsure whether a UFAD system would fit the needs of the Buda building. DSI was excited about the new concept and decided to implement the design on their new building.

GLOBAL IFS WORKED TOGETHER WITH DSI TO DESIGN AND IMPLEMENT A UFAD SYSTEM UTILIZING VERTICAL AIR TOWERS, WHICH PROVIDED ALL OF THE FOLLOWING ADVANTAGES:

- Cutting edge energy performance
- Reduced HVAC construction cost
- Reduced building cost through floor-to-floor height reductions
- Reduced operational cost
- Reduced finish-out flooring cost using TecCrete
- Improved space flexibility
- Improved indoor air quality and working environment
- Ability to have open ceiling arrangements by eliminating overhead ductwork and VAVs

BUILDING DESCRIPTION

DSI's Buda building is two-stories, with 10,000 sq. ft. of office space on each floor.

- **The entire office space utilizes a low-profile, 8" raised floor with the Global IFS TecCrete raised access floor system.**
- Large areas within the building utilized exposed TecCrete, the "original concrete surface panel." TecCrete flexes 50% less than ordinary steel floor access panels and creates the feel of walking on solid ground, as well as giving the building interior – particularly the higher-traffic lobby area – a polished look.
- Underfloor modular power elements were installed to create a readily accessible power infrastructure that could be adjusted quickly and efficiently.

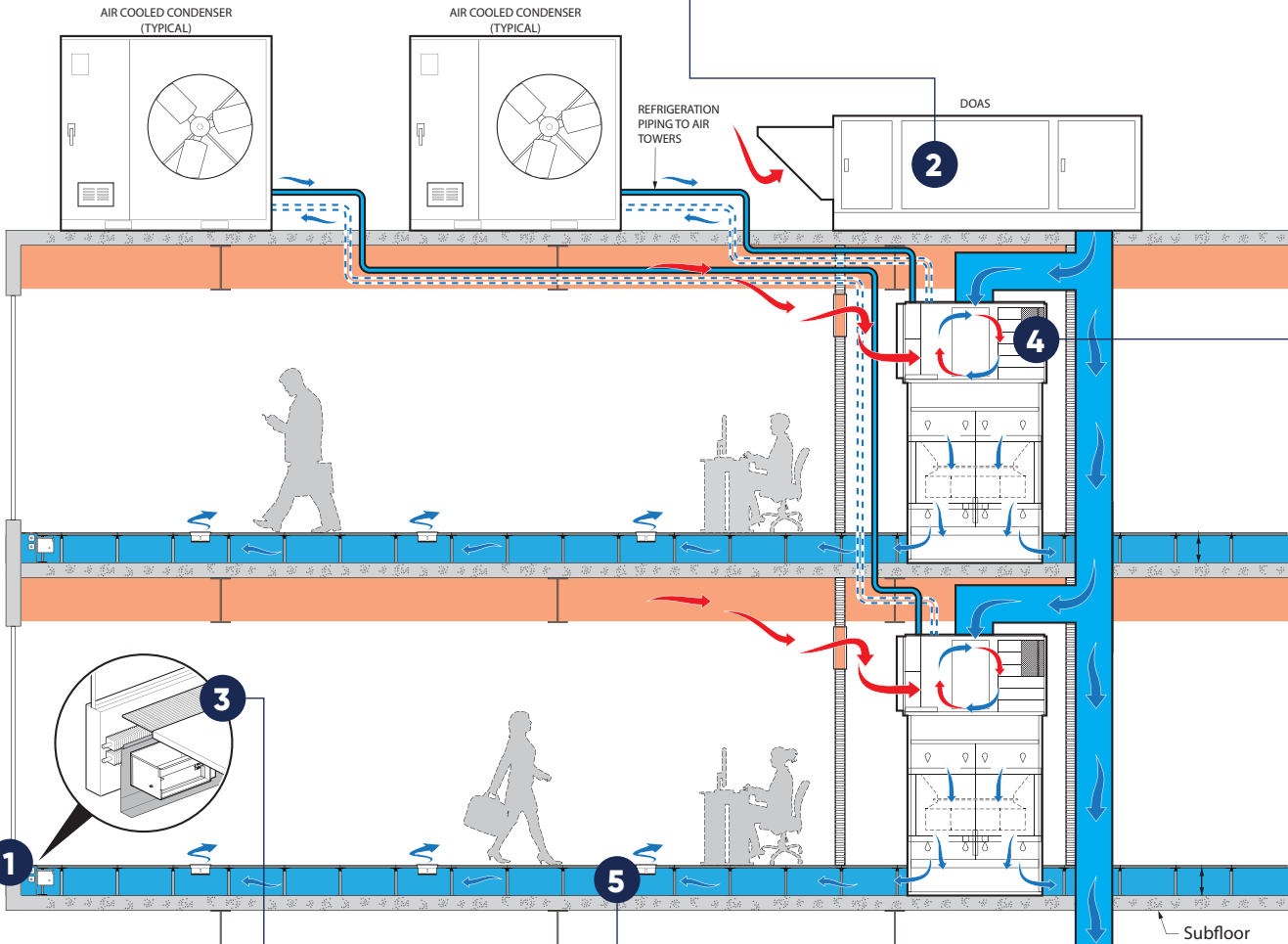
SYSTEM COMPONENTS

1 CONTINUOUS LINEAR PLENUM

The system relies on a continuous linear plenum to effectively cool and heat the perimeter of the building. UFAD dampers, placed every four feet along the plenum, deliver under-floor cooling air to meet cooling loads. Continuous hydronic finned-tube heating elements located within the plenum provide efficient heating during the winter.

2 DEDICATED OUTDOOR AIR SYSTEM (DOAS)

Outside air and restroom exhaust are served by a single dedicated outdoor air system (DOAS unit) with a total energy recovery wheel, and 14 tons of packaged DX air conditioning for pretreatment and dehumidification of the ventilation air.



3 HYDRONIC HEATING WATER SYSTEM

A hydronic heating water system was designed and built as the heating source for the perimeter finned-tube heaters. The installed system utilizes two high-efficiency electric heat-pump boilers to generate heating water. These heat pumps are approximately 3.5 times more efficient than traditional electric strip-heaters, and approximately 4 times more efficient than natural gas-fired boilers.

4 UFAD AIR TOWERS

Two 5,000 CFM Air Towers were installed on each floor to optimize energy savings and create equipment redundancies.

5 8" LOW-PROFILE FLOOR

8" finished floor height accommodated the underfloor air system.

RESULTS

Following the installation of Global IFS' UFAD system and air towers, the Buda building reported significant first-cost savings, exceptional energy efficiency and outstanding HVAC operational performance that were significantly above and beyond the expectations of both DSI and their energy consultant partners.



INITIAL COST SAVINGS

The UFAD design reduced DSI's HVAC first-cost by nearly \$30,000 (or \$1.43/sq. ft.) compared to the traditional overhead VAV system DSI had previously considered:

SYSTEM COMPONENTS	OVERHEAD	UNDERFLOOR AIR	COST DIFFERENCE
1 HVAC Piping	\$91,176	\$67,786	(\$23,390)
2 Sheet Metal	\$174,937	\$29,016	(\$145,921)
3 HVAC Equipment	\$279,490	\$192,290	(\$87,200)
4 UFAD Floor & Diffusers	\$0	\$286,962	\$286,962
5 Warehouse Systems	\$18,898	\$18,896	(\$2)
6 Plumbing Piping	\$81,866	\$81,866	\$0
7 Plumbing Fixtures & Equipment	\$59,304	\$59,304	\$0
8 Subcontractors	\$223,462	\$164,579	(\$58,883)
9 Fees & GCs	\$152,865	\$152,726	(\$140)
TOTALS	\$1,081,997	\$1,053,425	(\$28,572)
TOTALS per SQFT	\$54.10	\$52.67	(\$1.43)

In addition, the floor-to-floor height was reduced by approximately 16" per floor with the UFAD system design, resulting in significant additional building construction savings.

INCREASED FLEXIBILITY FROM MODULAR POWER ELEMENTS

Modular power solutions enabled increased flexibility in power and cable management, with easy access to underfloor systems for changes.

- 1 The plug-and-play elements, which came pre-wired and pre-tested, eliminated the need for a licensed electrician for future installation and modifications.
- 2 DSI's floor plan and furniture layout was subject to frequent change until after final installation. Modular power elements made it easy to work around the changes.



ENERGY COST AND OPERATIONAL SAVINGS

Following the implementation, DSI partnered with an energy consulting firm, Blue Ocean Energy, to track the building's energy consumption and provide Energy Star® Ratings.

While twelve consecutive months of energy data are required to obtain a conclusive Energy Star Rating, the first nine months of energy data have far exceeded everyone's expectations. The following table shows the actual energy usage for the first 8 months of operation, as well as projected energy use for the remaining 4 months to complete the year.

Month	Electric Usage			
	Overhead		Underfloor Air	
	One West Hills VAV Bldg		Buda UFAD Building	
	(KWH)	(KWH/sft)	(KWH)	(KWH/sft)
April	76,800	1.40	Building Under Construction	
May	73,200	1.33		
June	88,200	1.60		
July	81,600	1.48		
August	84,600	1.54	21,465	1.07
September	88,200	1.60	19,665	0.98
October	78,300	1.42	16,165	0.81
November	61,500	1.12	17,665	0.88
December	71,400	1.30	14,165	0.71
January	74,400	1.35	18,265	0.91
February	74,700	1.36	21,665	1.08
March	75,900	1.38	17,365	0.87
April (Estimated)			16,065	0.80
May (Estimated)			17,065	0.85
June (Estimated)			19,065	0.95
July (Estimated)			21,065	1.05
ANNUAL TOTAL/AVERAGE	928,800	1.41	219,680	0.92
Cost Savings Overhead vs. Underfloor Air			-35% KWH/sft savings	

Compared with DSI's corporate headquarters in Austin, TX, which utilizes traditional overhead VAV systems, the Buda building outfitted with UFAD Air Towers consumed 35% less energy per sq. ft., translating into utility cost savings of approximately \$0.53/sq. ft. annually.

A TOP ENERGY STAR RATING

Based on usage data to date, DSI's energy consultant partner Blue Ocean Energy estimates the building will achieve a 95 or better Energy Star score.

- An Energy Star Rating of 50 is considered median. A Rating of 75 indicates that the business is a top performer in energy efficiency, and may be eligible for an Energy Star certification.
- On average, ENERGY STAR certified buildings use 35% less energy than typical buildings nationwide, and command a premium of up to 16% for sales prices and rental rates.

Blue Ocean Energy couldn't believe the energy consumption and was concerned that they were monitoring the wrong meter. They indicated that the Buda building was "at the extreme low end of energy consumption for all of their customers city-wide."

"As the Mechanical Engineer of Record for the project, I was a little nervous about all of the new technology that we had planned for this building. Now that the project is complete, I'm very pleased with the overall performance of the system and the energy performance so far has been amazing. The building is one of the quietest I've ever experienced with virtually no perceptible HVAC noise at all." —Kurt Zinsmeyer

	ELECTRIC USAGE	
	Overhead	Underfloor Air
	One West Hills VAV Building	Buda UFAD Building
ENERGY STAR RATING	71	95 (Estimated)

IMPROVED PRODUCTIVITY AND INDOOR ENVIRONMENT

Following the implementation of UFAD Air Towers, occupants have reported experiencing improved comfort in the Buda building stemming from better ventilation and indoor air quality, thermal comfort and reduced HVAC equipment noise. Some occupants have described the building as "eerily quiet."

- Numerous studies and analyses, including those by the World Green Building Council, highlight that improvements in indoor environments are associated with increased productivity. Better ventilation and individual temperature control – both benefits provided by UFAD systems – are linked to productivity increases of 11% and 3%, respectively.
- Underfloor air distribution systems can also result in cleaner air, with up to 13% reduction in exposures to occupant-generated pollutants.
- UFAD systems can also help drive improved productivity – which can translate into significant cost savings, considering that office payroll can be 100 times greater than the energy cost of a building.



SUMMARY

HOW UFAD UTILIZING AIR TOWERS BENEFITED THE BUDA BUILDING

- First-cost savings during initial construction of about \$30,000 compared to traditional overhead VAV system
 - + Minimal ductwork and associated insulation
 - + Reduced HVAC terminal equipment and associated controls
 - + Architectural and structural cost savings due to reduced floor-to-floor height
 - + Maximized floor space by minimizing mechanical equipment space
- Exceptional energy efficiency, consuming 35% less energy per sq. ft. compared to traditional overhead VAV
- Annual utility cost savings of nearly \$11,000 owing to energy efficiency
- Improved occupant comfort and ventilation effectiveness
- 95(+) Energy Star score
- Ability to have open ceiling arrangements by eliminating overhead ductwork and VAVs
- Space flexibility due to access floor, modular power and no overhead mechanical systems



A SOLUTION FOR EVERY BUILDING



Low Profile Series

Ultra low profile flooring system with modular power and cable management.

Flex Series

Highly customizable solution that can include modular power, cable routing, WiFi, and more.



Integrated Series

Comprehensive solution that can provide all the benefits of the Flex Series in addition to UFAD and other underfloor systems.

ARE YOU READY TO MEET THE FUTURE?

We're committed to bringing the exceptional environments of the future to every building—today. Whether you're a developer, architect or engineer, and whether or not you're familiar with raised access flooring, we'll work collaboratively with your team to meet your particular needs and budget, and to deliver the solution that's ideal for your particular building.

Interested in learning more?
Contact us: solutions@globalifs.com