Manufactured for and Distributed by

SELECTPREFAB SOLUTIONS

AirFixture®

An Introduction to Underfloor Air Distribution (UFAD)

Contact: Ed Patti Tel 407-466-9987 www.selectprefabsolutions.com

Coach 10 Hudson Yards Tower C

New York, New York

Coach 10 Hudson Yards Tower C

New York, New York

20 East End Avenue Luxury Tower

New York, New York

Novartis Office Building

East Hanover, New Jersey

Novartis Office Building

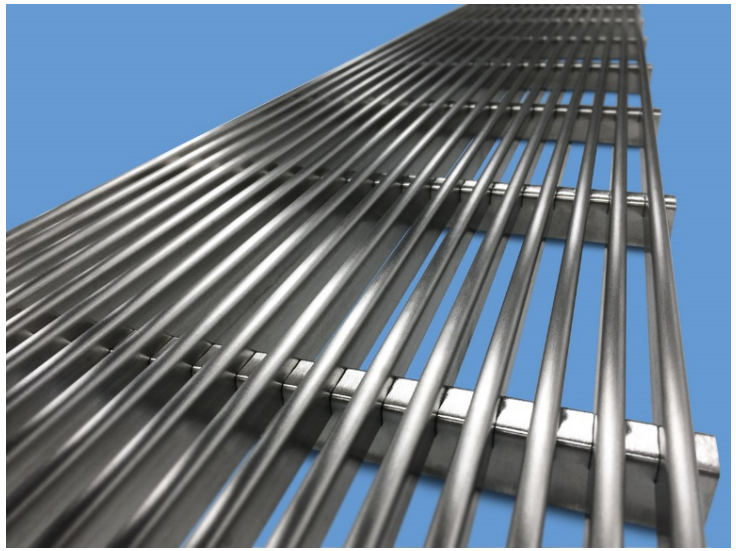
East Hanover, New Jersey

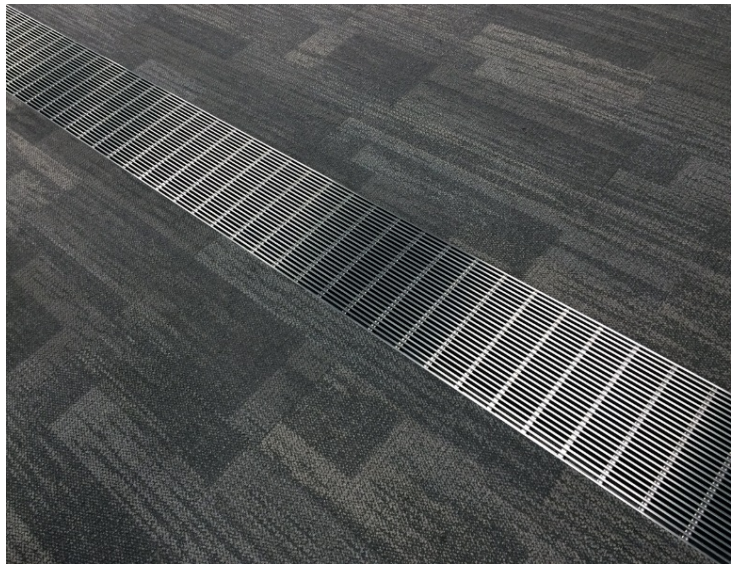
Novartis Office Building

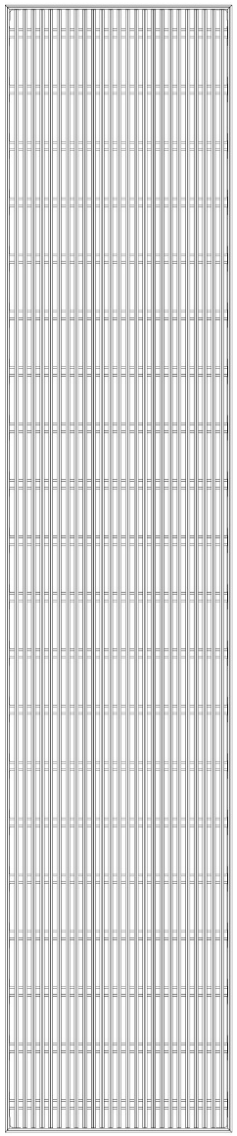
East Hanover, New Jersey

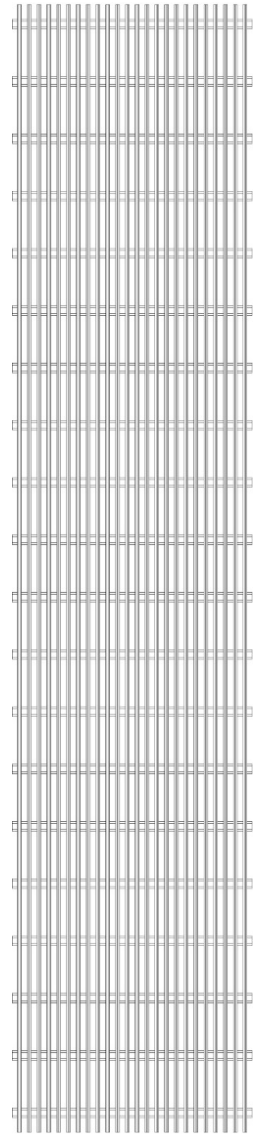
Grand Egyptian Museum

Giza, Egypt









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New Low Cost Stainless Steel Linear Grille

UFAD Systems & Products

Surrey City Centre Public Library

Surrey, British Columbia

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DST Round House

Kansas City, Kansas

AirFixture®

DST Round House

Kansas City, Kansas

1. 20 years experience, every building type
2. 1000+ projects, 1000+ million sq.ft.
3. 26 countries, every climate type
4. Over 100 million sq. ft. installed
5. By far the broadest product line in the world
6. Comprehensive design support, advanced R&D
7. More application experience than anyone
8. Lower cost, technically advanced systems
9. Controls, flooring and HVAC system coordination
10. On-site project management by AFX engineers

20 Years of Experience, 100,000,000+ sq.ft. Installed

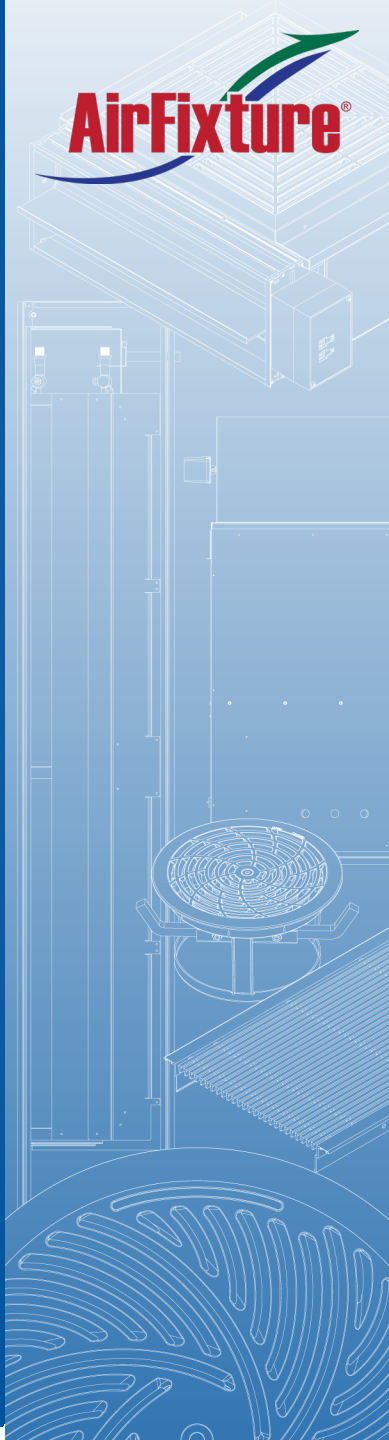
Today's Topics

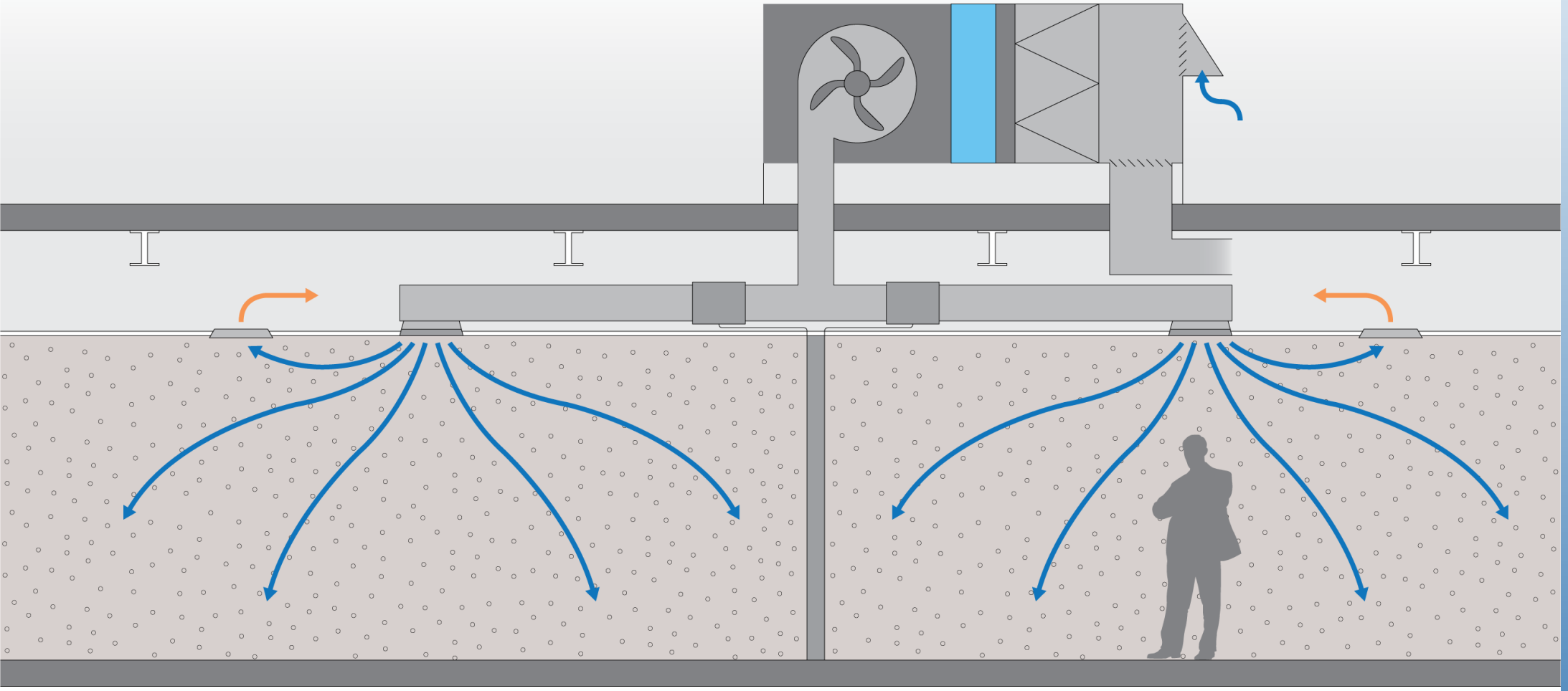
- Basic UFAD
- UFAD Benfits

-SoHo

-QT-35

-Prestige(wireless diffuser)

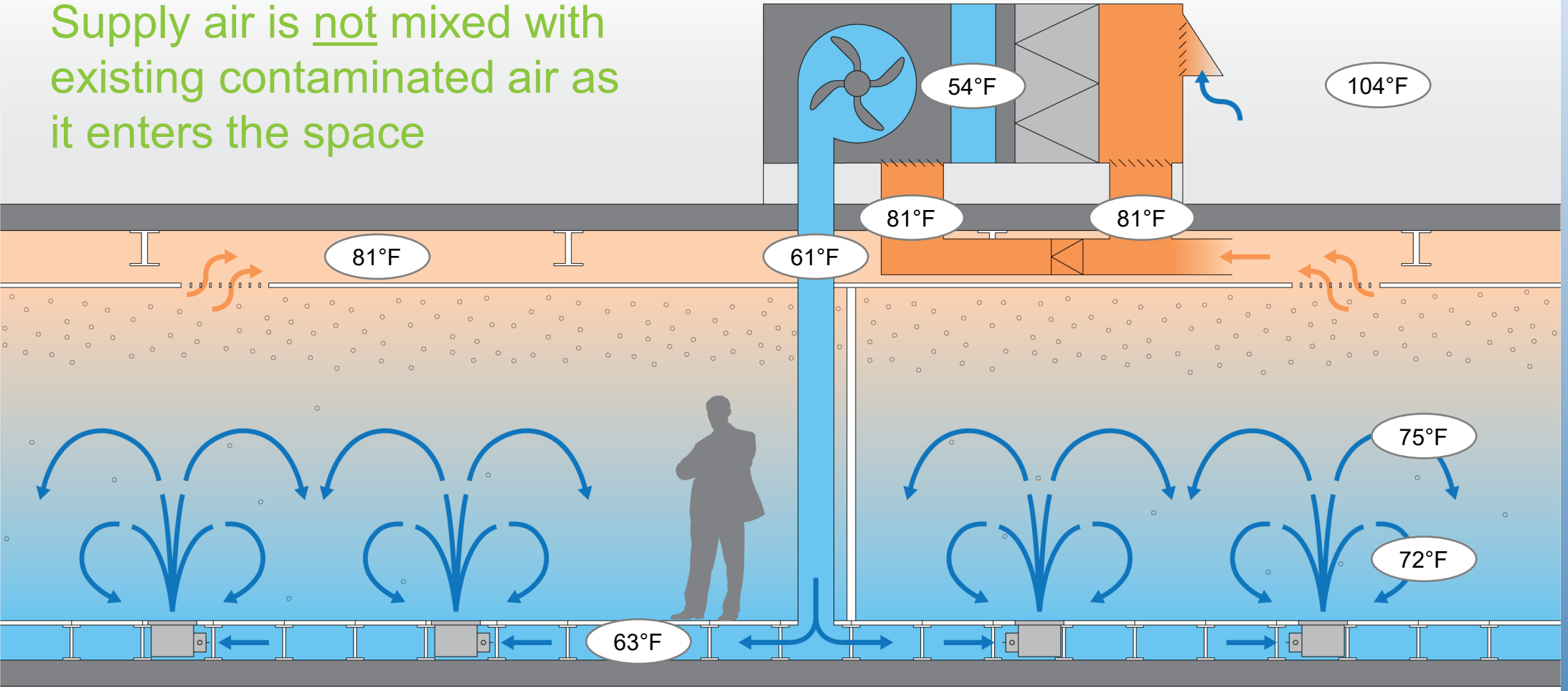




Conventional Overhead (Mixing Systems)

Zone Pollutant Transfer

Supply air is not mixed with existing contaminated air as it enters the space



Underfloor Air Conditioning (Stratified Systems)

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Building Structure

Furniture

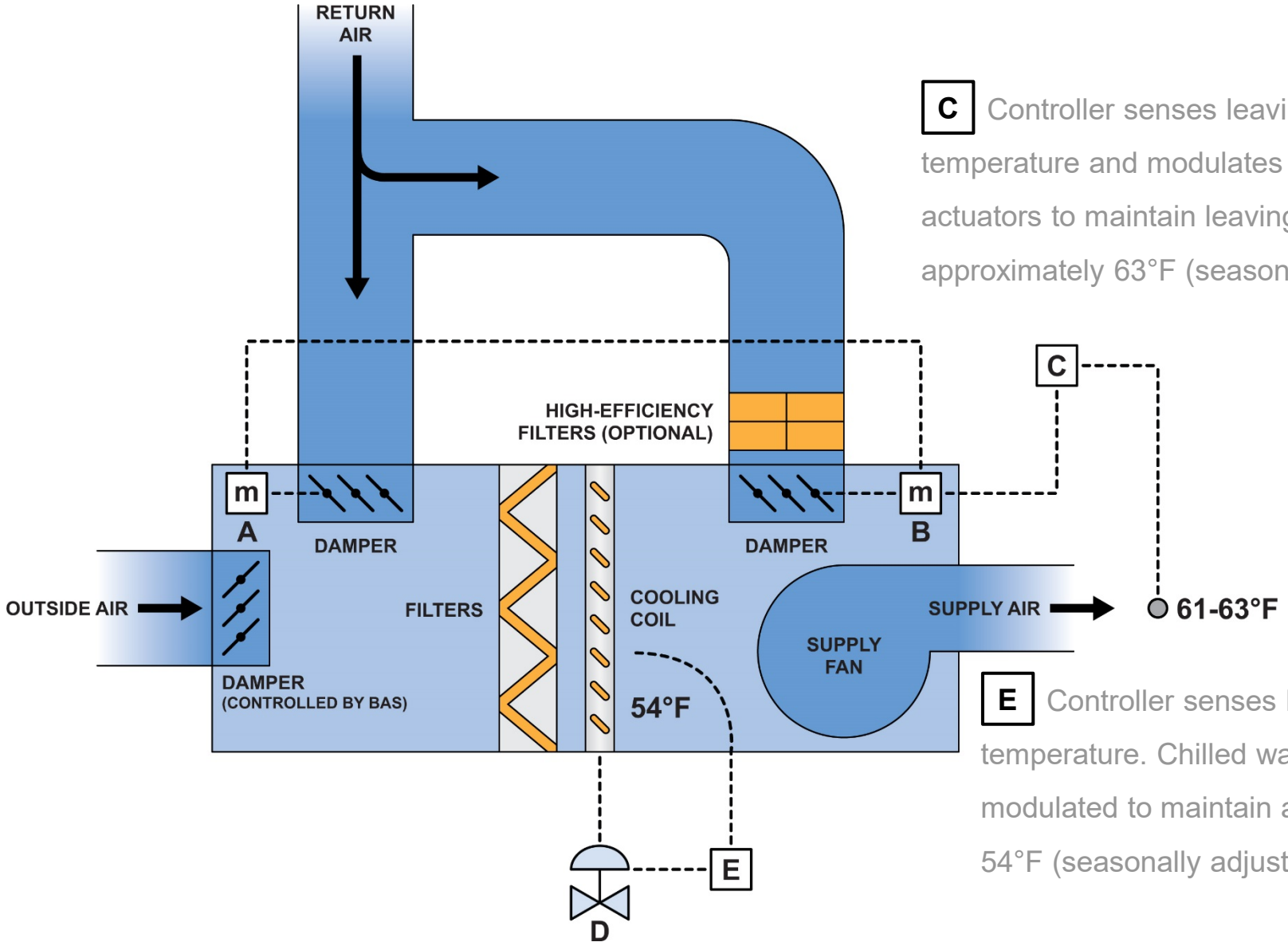
Access Floor

Plug & Play
Power

Voice & Data

Underfloor
HVAC System

Building Technology Platform (Sustainable)



C Controller senses leaving mixed air temperature and modulates **m** "**A**" & "**B**" actuators to maintain leaving air setpoint @ approximately 63°F (seasonally adjusted).

E Controller senses leaving coil temperature. Chilled water valve "**D**" is modulated to maintain approximately 54°F (seasonally adjusted).

Indoor Air Handling Unit

Conventional VAV

AirFixture Underfloor Air

Air Flow: Mixing Systems vs. Stratified Systems

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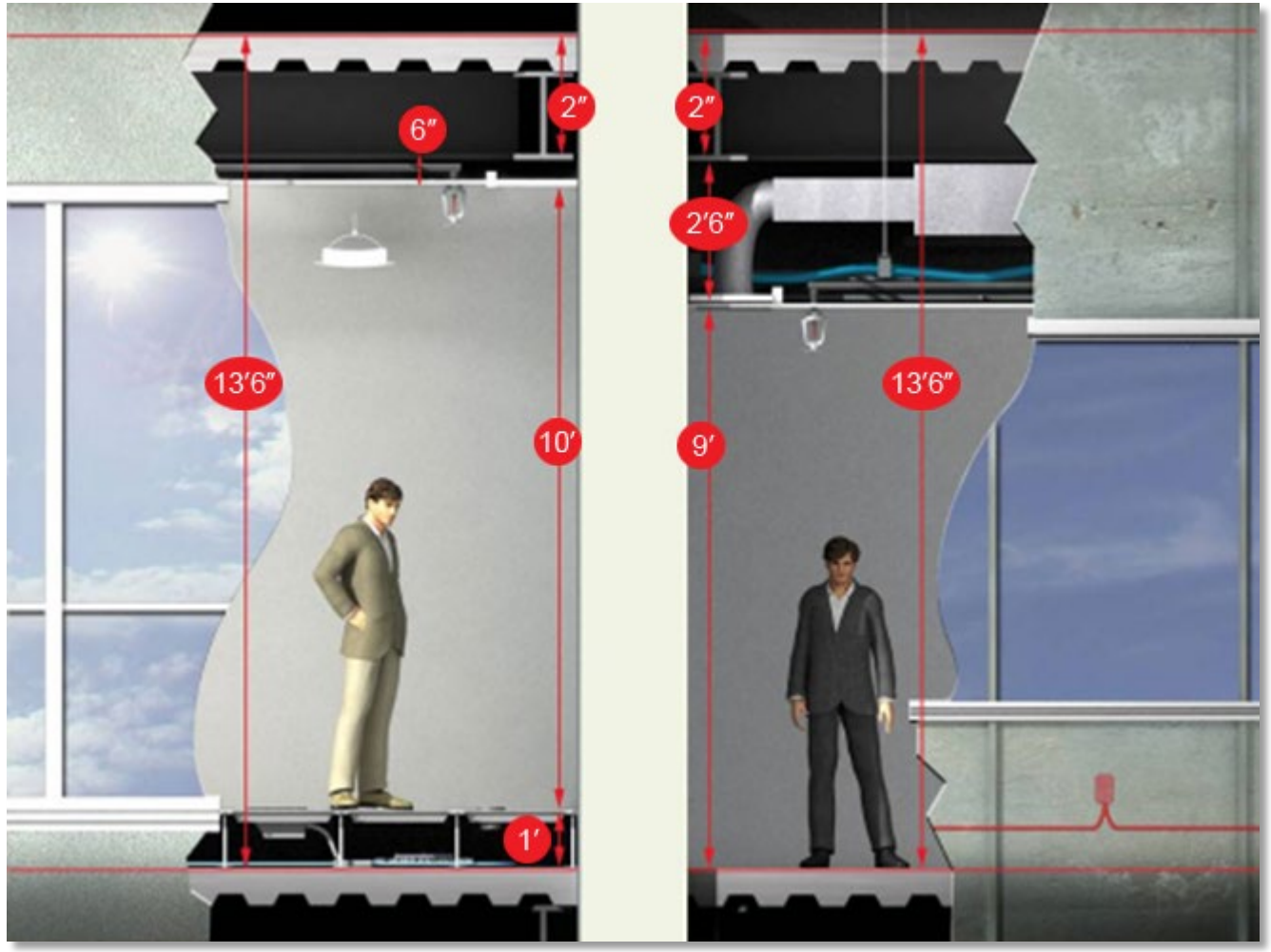
1. Improved Flexibility for building services
2. Achieve cost effective LEED certification
3. Improved Ventilation Efficiency and indoor air quality
4. Improved occupant Comfort, Productivity and Health
5. Reduced energy use
6. Reduced first & Life-cycle costs
7. Reduce slab-to-slab heights & façade costs

Benefits of UFAD

- Reduction in overhead duct work leads to taller ceilings
- Increased windows sizes improve day-lighting and views
- Reduce slab-to-slab height
- Reduced run lengths
- Promotes reuse of materials
- Wire & cable only where it is needed
- Reduced ductwork
- Eliminate drop-ceiling



High Performance & Material Efficiency Benefits

Sustainable, High Performance, Better Value!

Strategies	Daylighting	IAQ	Flexibility	Energy	Water	Material	Life-Cycle Cost	Total
Slab-to-Slab Thermal Glazing	✓			✓			✓	3
Lighting System Controls	✓			✓			✓	3
Modular Walls & Furniture			✓			✓	✓	3
Green Roofs				✓			✓	2
Rainwater Collection/Reuse					✓		✓	2
Ergonomic Seating							✓	1
Sound Masking							✓	1
Underfloor Service Distribution	✓	✓	✓	✓		✓	✓	**6**

Comparing Strategies

63-64 degrees F = Savings

- UFA - Reduced fan HP by 30%-50%
- More opportunity for Economizer usage

Lower Horsepower = Energy Savings

HP or KW = air flow x static pressure/C

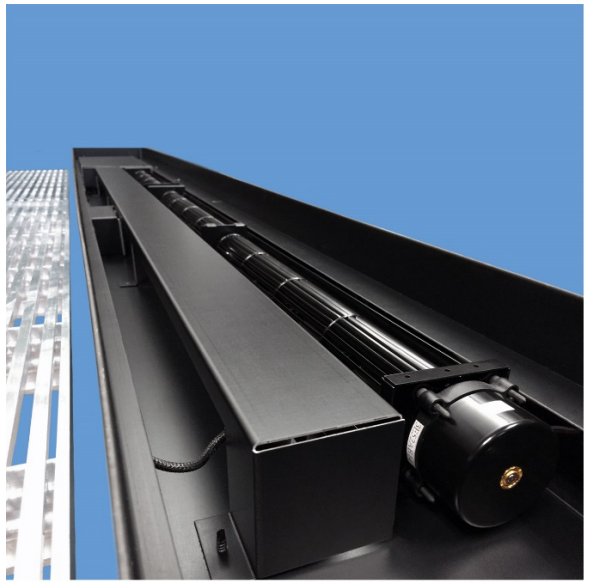
with 20% decrease in supply air due to return air load transfer, 10% increase due to increased supply air temp, and 1.5 in. decrease in static pressure:

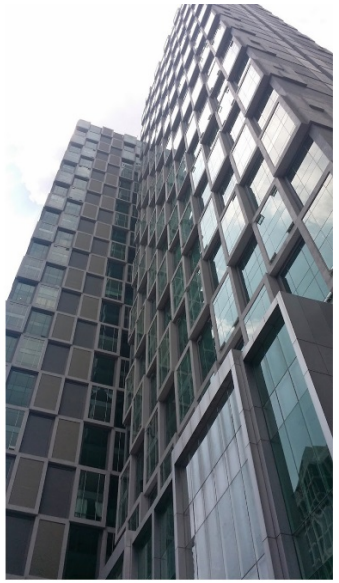
HP or KW = (0.8 x 1.1) x (2.25/3.75)/C = 53%

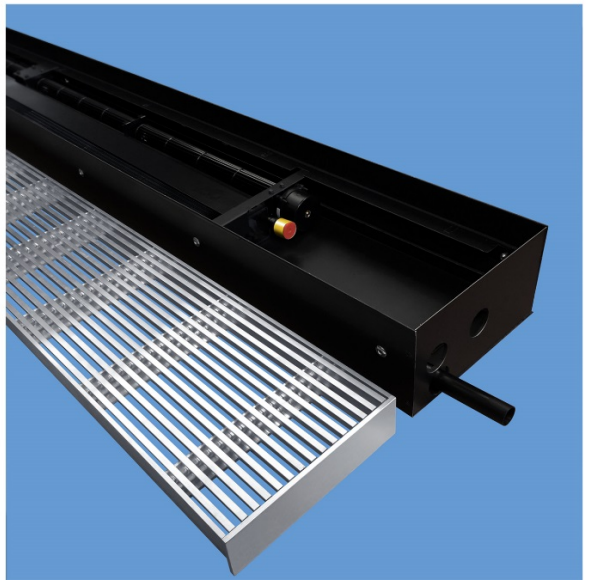
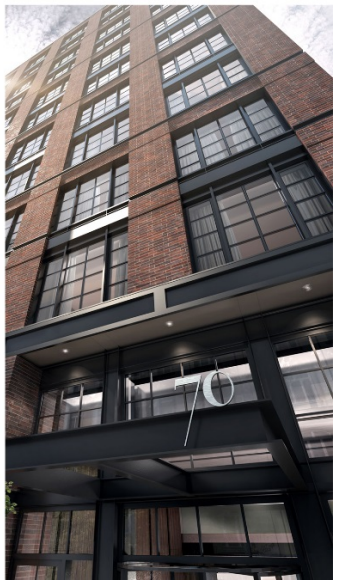
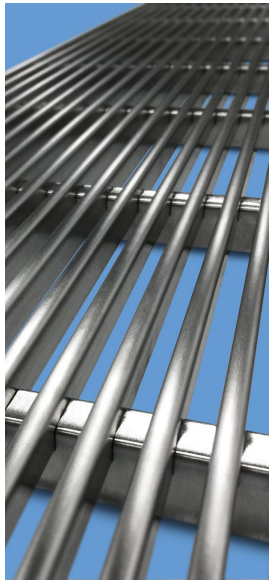
30 - 50 % HP or KW reduction

ASHRAE 62.1.2.1 – 2019

Stratified Air Distribution Systems (Section 6.2.1.2.1)	
Floor supply of cool air where the vertical throw is greater than or equal to 60 fpm (0.25 m/s) at a height of 4.5 ft (1.4 m) above the floor and ceiling return at a height less than or equal to 18 ft (5.5 m) above the floor	1.05
Floor supply of cool air where the vertical throw is less than or equal to 60 fpm (0.25 m/s) at a height of 4.5 ft (1.4 m) above the floor and ceiling return at a height less than or equal to 18 ft (5.5 m) above the floor	1.2
Floor supply of cool air where the vertical throw is less than or equal to 60 fpm (0.25 m/s) at a height of 4.5 ft (1.4 m) above the floor and ceiling return at a height greater than 18 ft (5.5 m) above the floor	1.5





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SoHo®
Living Comfortable

Low Profile Fan-Boosted Linear Terminal

The Challenge

Finned Tube Radiators

The Solution

SoHo Fan-Powered Terminals

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SoHo®
Living Comfortable

Why SoHo?

SoHo-w

- 20 Gauge (1mm) galvanized steel trough housing, pre-painted flat black
- Threaded leveling legs for unit height adjustment
- Coils are rated in accordance with AHRI standard 410
- Supply and return water connections located on one end of the trough; custom configurations and dimensions are available
- Hot or chilled water can be passed through based on building / season demands and facility operators control
- IEQ double deflection drain pan extends under entire fin pack and headers (cooling models only)
- Trough interior (including the drain pan) is fully lined with ArmaFlex (style) flexible closed cell insulation, to prevent undesirable condensate formation
- 24VDC variable speed ECM cross-flow fans (sizes and configurations based on trough / heater length)
- Compatible with standard 24VAC Plug & Play or 120V / 208V / 230V / 277V electrical supplies
- Extruded aluminum or Stainless Steel linear grille, rated for nominal 800lbs. (363kg) load strength
- Grilles available in ten (10) standard colors; customized colors and finishes can be provided to match architectural design (specify on order)

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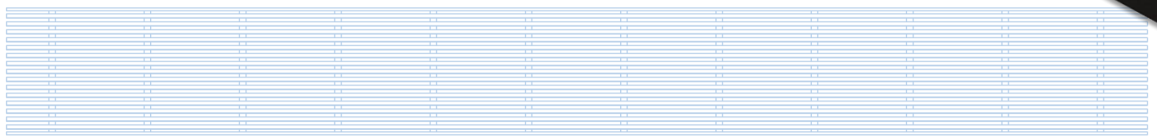
Hydronic Fan-Powered Heating / Cooling

SoHo-w

Example Dimensions & Performance Ratings

Contact AirFixture for Job Specific Product Specifications



DIMENSIONS			HEATING	ELECTRICAL
LENGTH	WIDTH	HEIGHT	(BTU/h)	V
28"	6"–16"	3.5" (Special Low Height) 4" (Standard Minimum) 8" (Standard Maximum)	4,370	120 / 208 / 230 / 277 Single Phase / 60Hz
42"			9,140	
56"			11,560	
72"			16,380	
84"			21,500	
96"			26,680	

Hot Water T°: 140°F (60°C) | Air Inlet T°: 65°F (21°C)

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Hydronic Fan-Powered Heating / Cooling

SoHo-e

- 20 Gauge (1mm) galvanized steel trough housing, pre-painted flat black
- Threaded leveling legs for unit height adjustment
- ETL listed electric heater, fully certified to UL standards (0.5–2.0KW standard, other sizes available on order)
- Single-point electrical power connection and unit-mounted disconnect
- 24VDC variable speed ECM cross-flow fans (sizes and configurations based on trough / heater length)
- Compatible with standard 120V / 230V / 277V electrical supplies
- Extruded aluminum linear grille, rated for nominal 800lbs. (363kg) load strength
- Grilles available in ten (10) standard colors; customized colors and finishes can be provided to match architectural design (specify on order)

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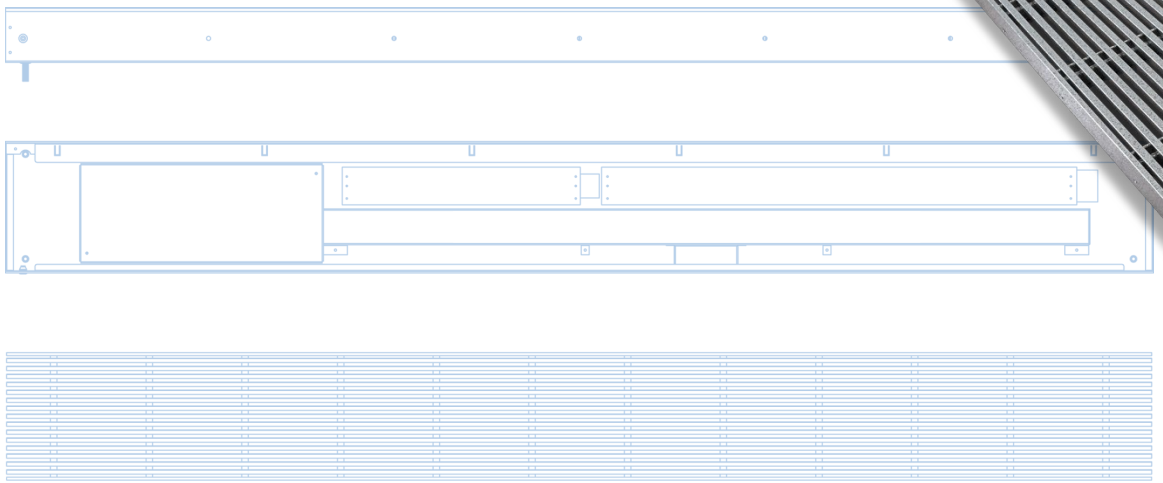
Electric Fan-Powered Heating

SoHo-e

Example Dimensions & Performance Ratings

Contact AirFixture for Job Specific Product Specifications



Drip-Proof Construction

DIMENSIONS			HEATING	ELECTRICAL
LENGTH	WIDTH	HEIGHT	KW	V
32"–96"	6"–16"	3.5" (Special Low Height) 4" (Standard Minimum) 8" (Standard Maximum)	0.10 – 3.0 0.375 KW/ft (Approximate)	120 / 208 / 230 / 277 Single Phase / 60Hz

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Electric Fan-Powered Heating

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Ideal for supplemental heating or cooling in perimeter locations for residential or commercial projects.

SoHo electric heaters avoid the delivery of super hot air common with regular convectors, which rises straight to the ceiling. Instead, warm fan-boosted air is delivered consistently, improving comfort for room occupants.

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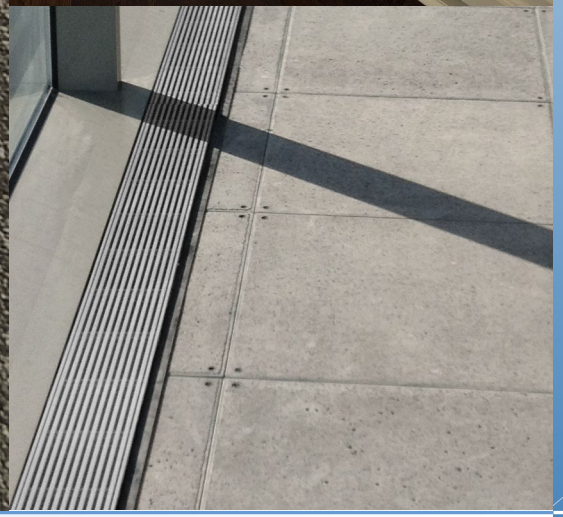

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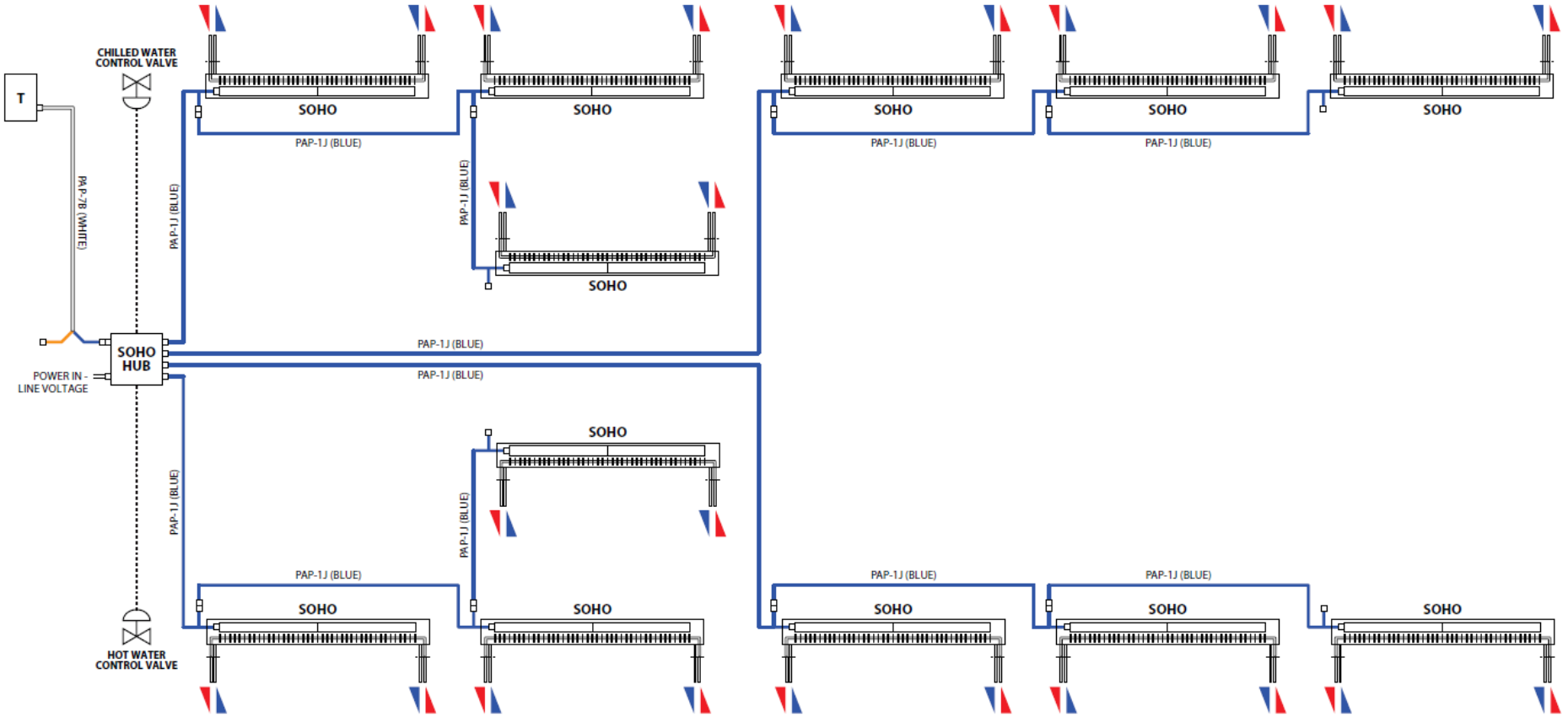
Flexible Mounting

Sample Hydronic SoHo Wiring

Low-Profile Heating



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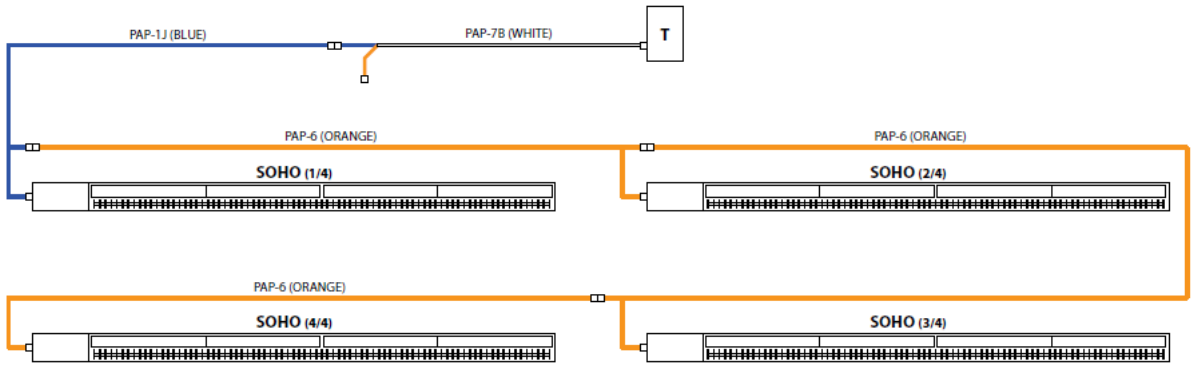
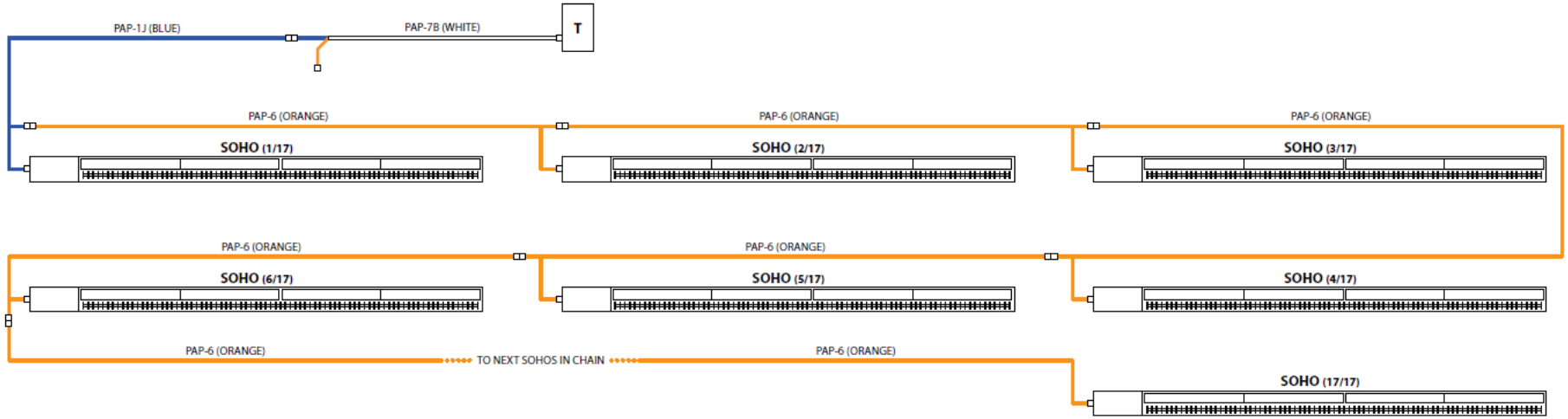
Sample Electric SoHo Wiring

Low-Profile Heating

FOUR (4) SOHO ZONE



SEVENTEEN (17) SOHO ZONE



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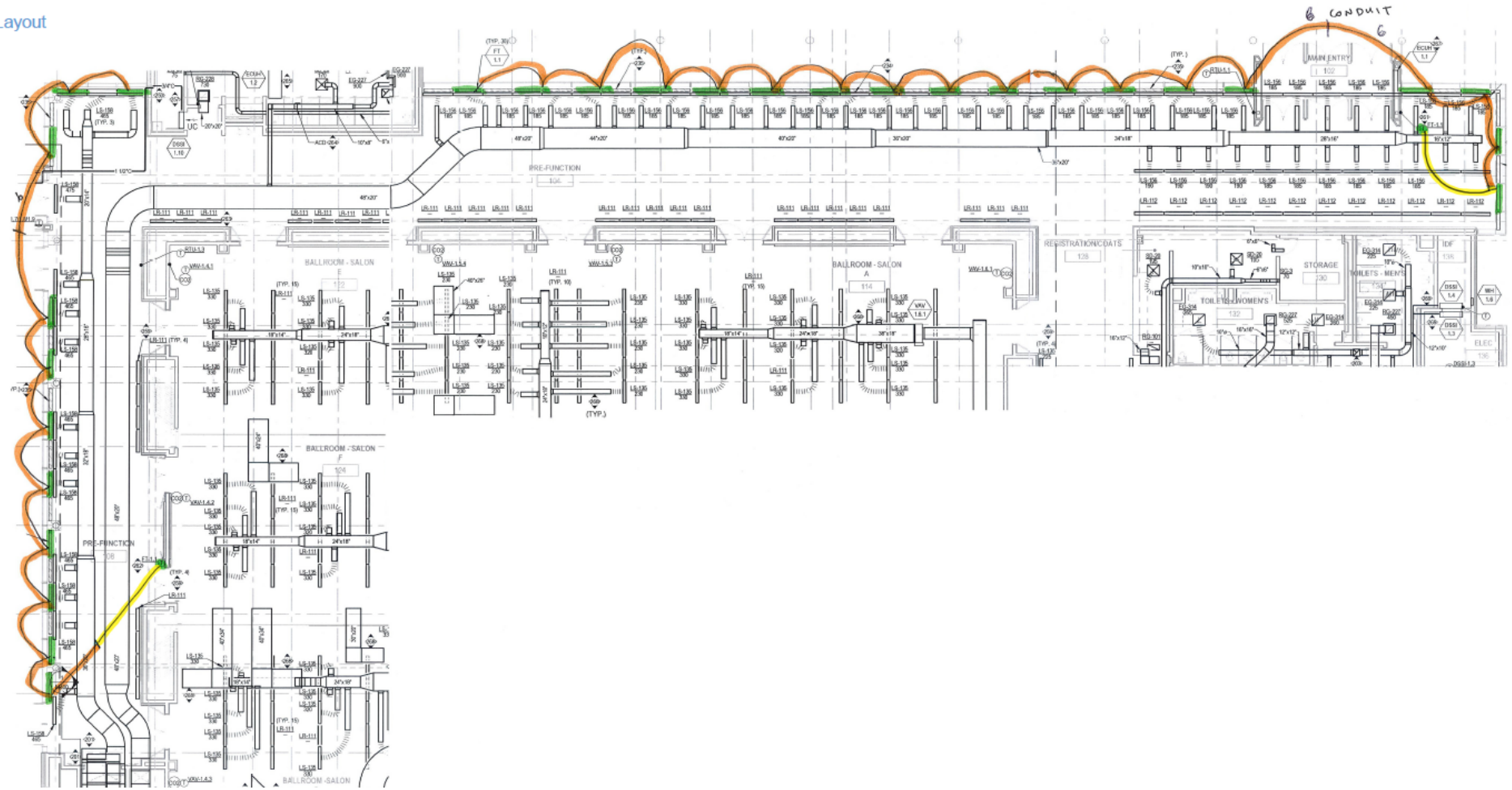
Design Layout Examples

Low-Profile Heating

Cabling Layout



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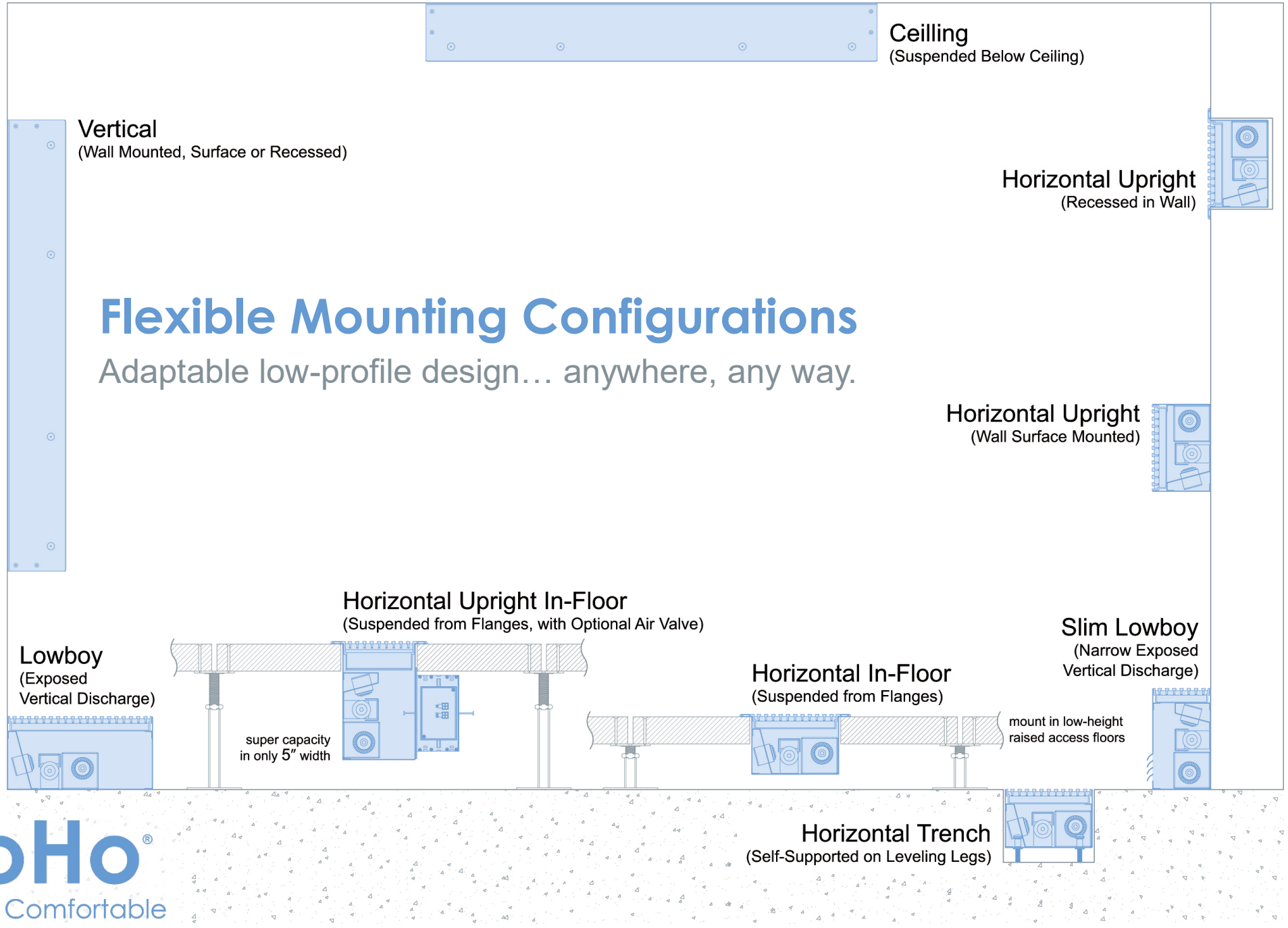

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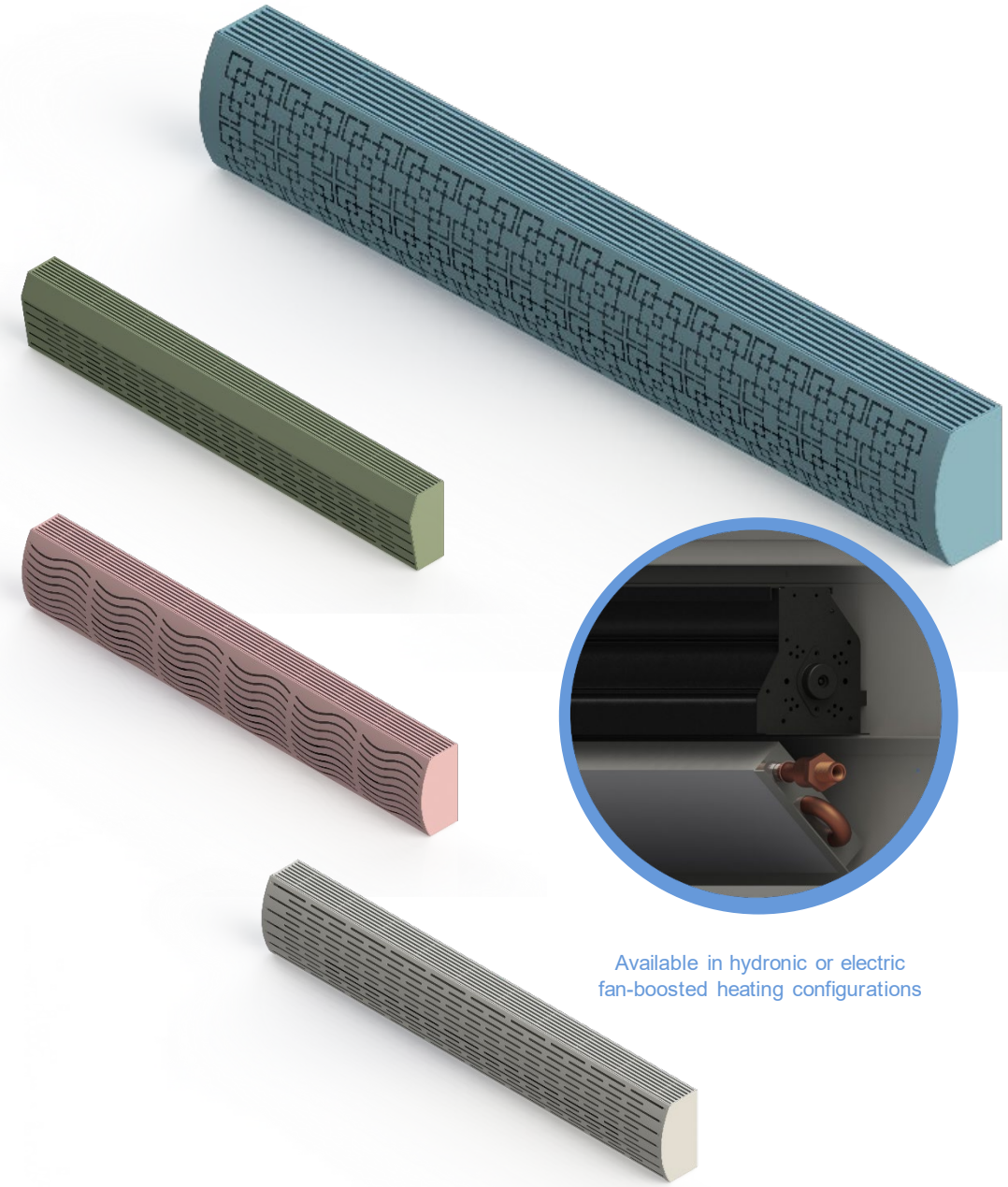
SoHo Slim Low Boy Fan-Powered Linear Terminal

- Available in a variety of 20-gauge galvanized steel housings
- We offer a range of unique shapes and air intake opening patterns
- Manufactured-to-order to meet the dimensional and performance specifications of each individual project.
- Designed to blend seamlessly and compliment the aesthetics of an architectural space.



Available in hydronic or electric fan-boosted heating configurations

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SoHo Slim Lowboy Fan-Powered Linear Terminal

Designer Color Finishes

SoHo Slim Lowboy terminals are available in a wide selection of unique color finishes, carefully selected to compliment the latest trends in modern interior design. Additionally, custom color selections are available to match an Architect's unique requirements for a project (specify on order; custom colors may require an additional fee).

"Back to Nature" RAL# 1000 (Green Beige)	"Charasmatic" RAL# 1015 (Ivory)	"Rumba Orange" RAL# 2011 (Deep Orange)	"Cider Spice" RAL# 3012 (Beige Red)	"Bubble Shell" RAL# 3015 (Light Pink)
"Bluebird" RAL# 5024 (Pastel Blue)	"Secret Meadow" RAL# 6011 (Reseda Green)	"Dragonfly" RAL# 7000 (Squirrel Grey)	"Graphic Charcoal" RAL# 7012 (Basalt Grey)	"Battleship Gray" RAL# 7030 (Stone Grey)
"Creamy Mushroom" RAL# 7044 (Silk Grey)	"Dusty Lilac" RAL# 7047 (Telegrey)	"Painter's White" RAL# 9003 (Signal White)		

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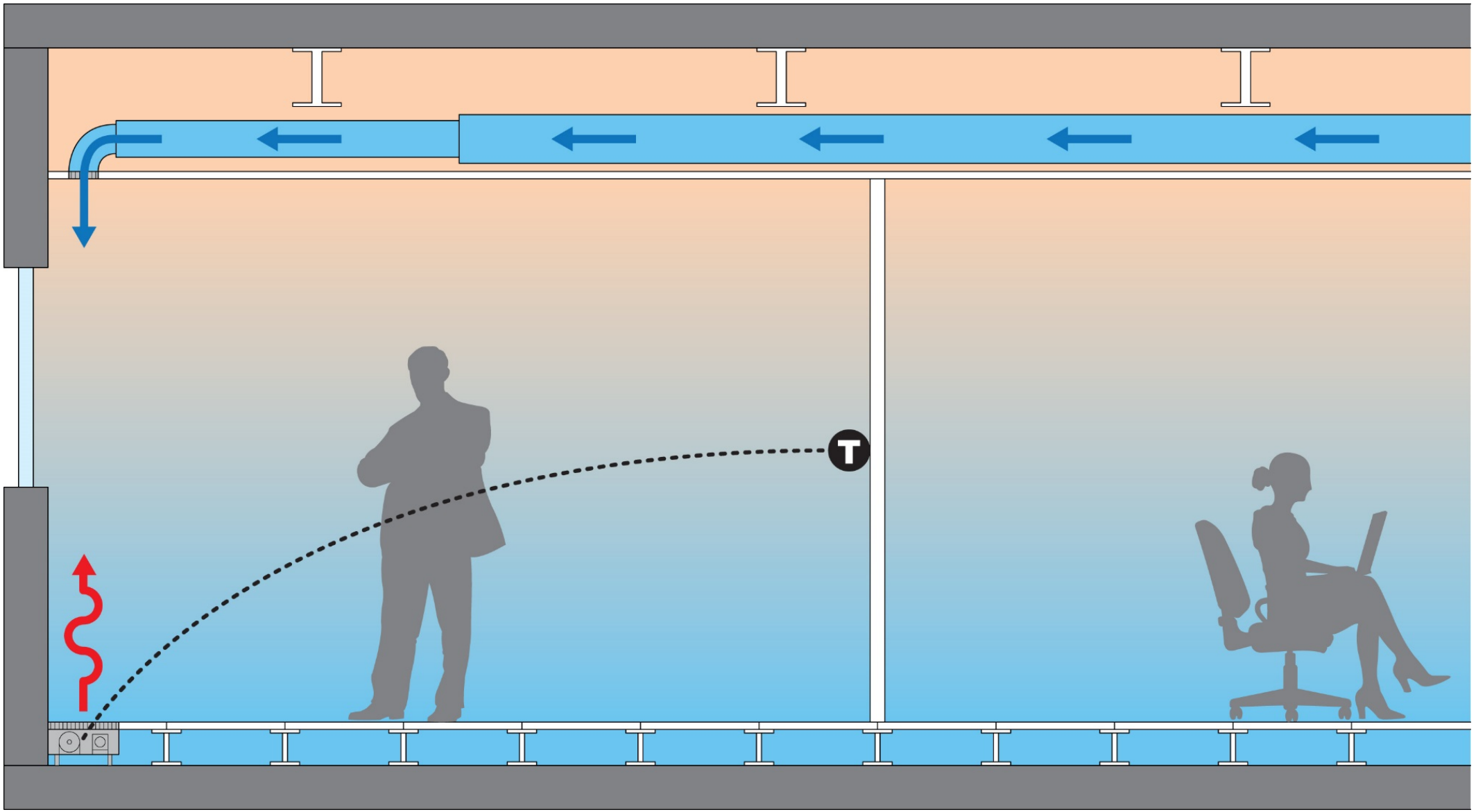

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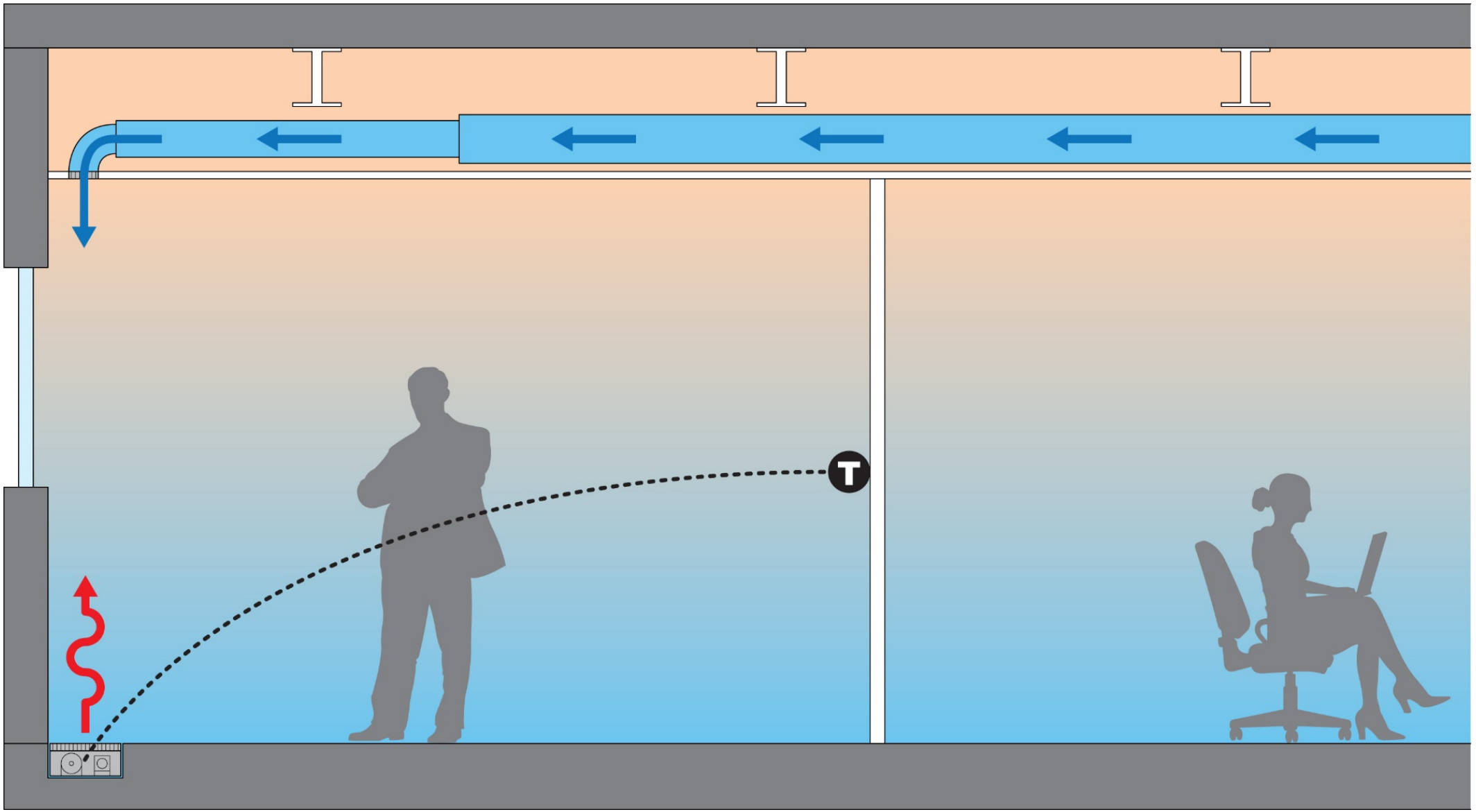

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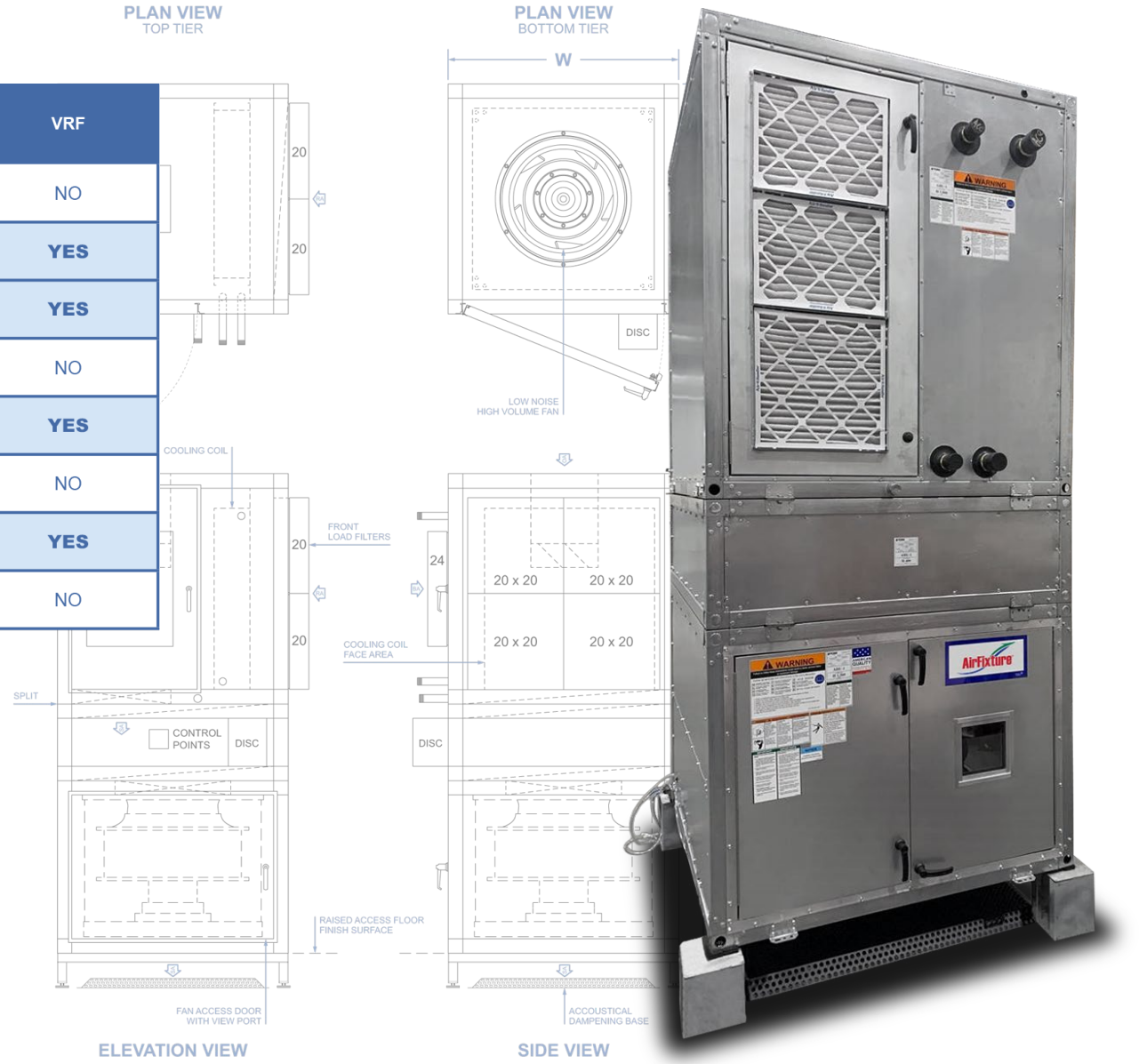
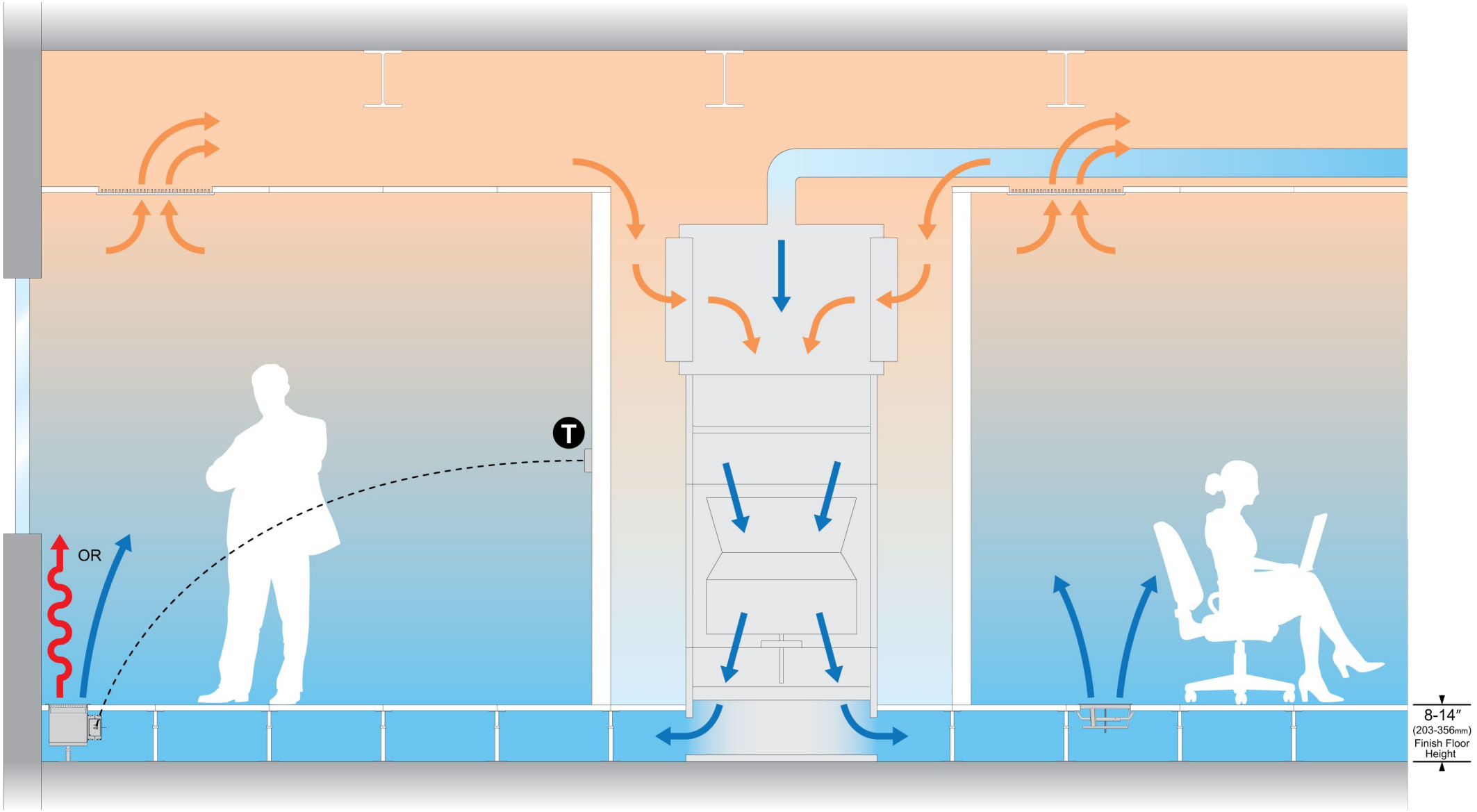
	8" AirFixture Low Profile UFAD System	Overhead VAV	Self-Contained Package Unit with Overhead VAV	VRF
Low Installed Mechanical Cost	**YES**	NO	**YES**	NO
50% Mechanical Closet Size Reduction	**YES**	NO	NO	**YES**
Quiet Performance	**YES**	NO	NO	**YES**
Lower Building Heights	**YES**	NO	NO	NO
Lower Energy Costs	**YES**	NO	NO	**YES**
Flexible Building Construction	**YES**	NO	NO	NO
Employee Comfort	**YES**	NO	NO	**YES**
Improved Ventilation Effectiveness	**YES**	NO	NO	NO

The clear winner.



QT-35 Downflow Air Handling Unit

UFAD Systems & Products



System 5: CV diffusers everywhere, with supply airway partitions containing different and appropriate air temps for each affected zone. Column mixing units are often included.
Advantages: No underfloor obstruction, ability to vary underfloor air temp by exposure, use of low temp outside air (ideal for tall buildings)

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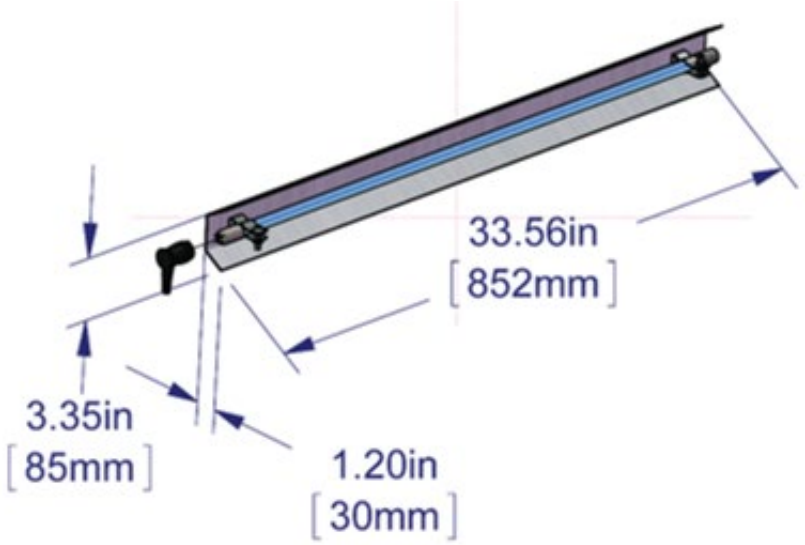
Typical UFAD System Designs



UV lighting

Mechanical First Cost Can be less than traditional overhead VAV

COST ANALYSIS OF A 900,000 SF PROPOSED OFFICE BUILDING

UFAD Cost Model

Major Cost Difference Between Overhead Air and Underfloor Air

Base Budget Breakout	Traditional Overhead Air Distribution			Underfloor Air Distribution			Cost Difference	% Difference
	C&S	TI	Total	C&S	TI	Total		
HVAC Piping	$2,398,874	$0	$2,398,874	$2,555,144	$0	$2,555,144	$156,270	
Sheet Metal	$4,993,857	$3,139,176	$8,133,033	$1,451,201	$0	$1,451,201	($6,681,832)	
HVAC Equipment	$7,313,921	$1,429,235	$8,743,156	$7,048,490	$2,865,568	$9,914,058	$1,170,902	
Raised Access Floor	$0	$0	$0	$414,879	$5,360,155	$5,775,034	$5,775,034	
HVAC Subcontractors	$2,607,720	$1,938,901	$4,546,621	$2,532,779	$232,235	$2,765,014	($1,781,607)	
TOTAL	$17,314,372	$6,507,312	$23,821,684	$14,002,493	$8,457,958	$22,460,451	**($1,361,233)**	**-5.7%**
Savings/SF						**900,000 sft**	**($1.51)**	

COST REDUCTIONS

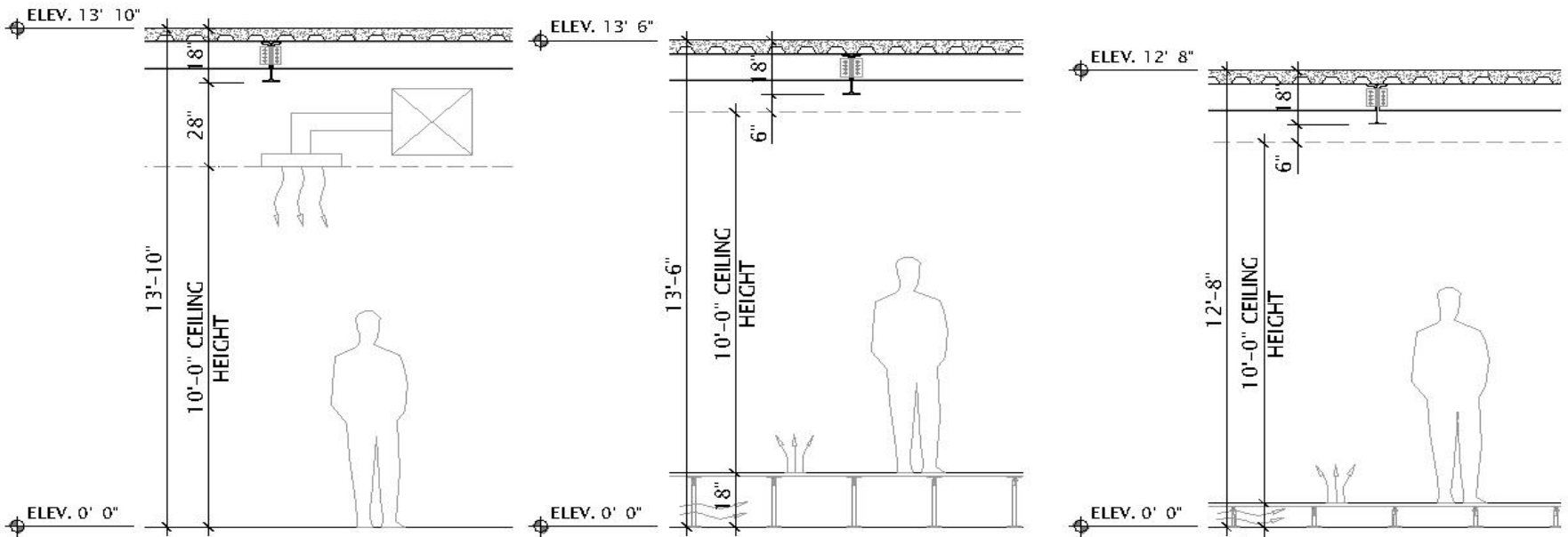
Sheet metal Test & Balance Controls BIM Coordination

COST ADDS

Piping Raised Floor Air Towers

Developer Cost Savings

FLOOR TO FLOOR HEIGHT REDUCTIONS

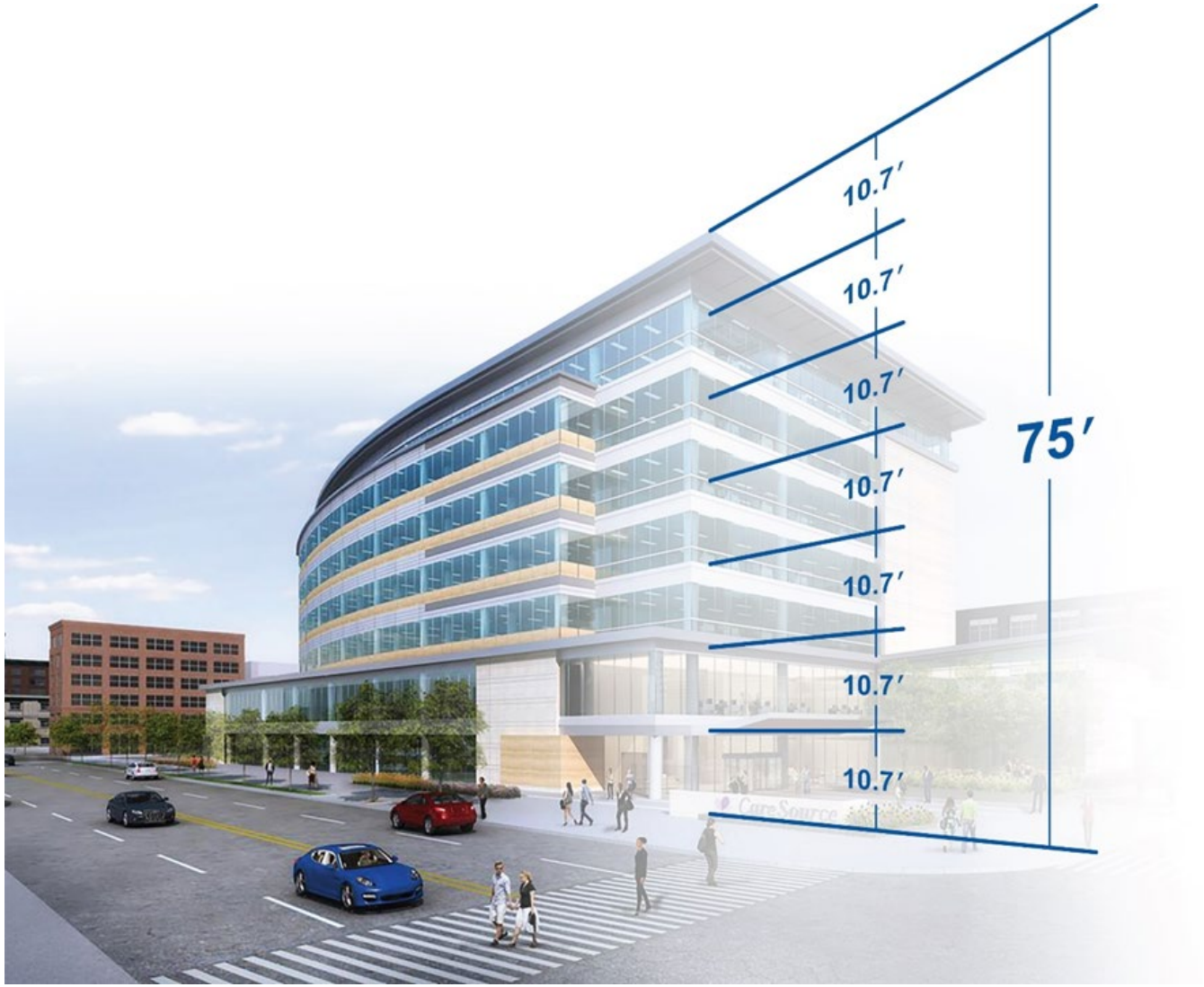


CONVENTIONAL OVERHEAD HVAC

CONVENTIONAL UFAD

AIR TOWER UFAD

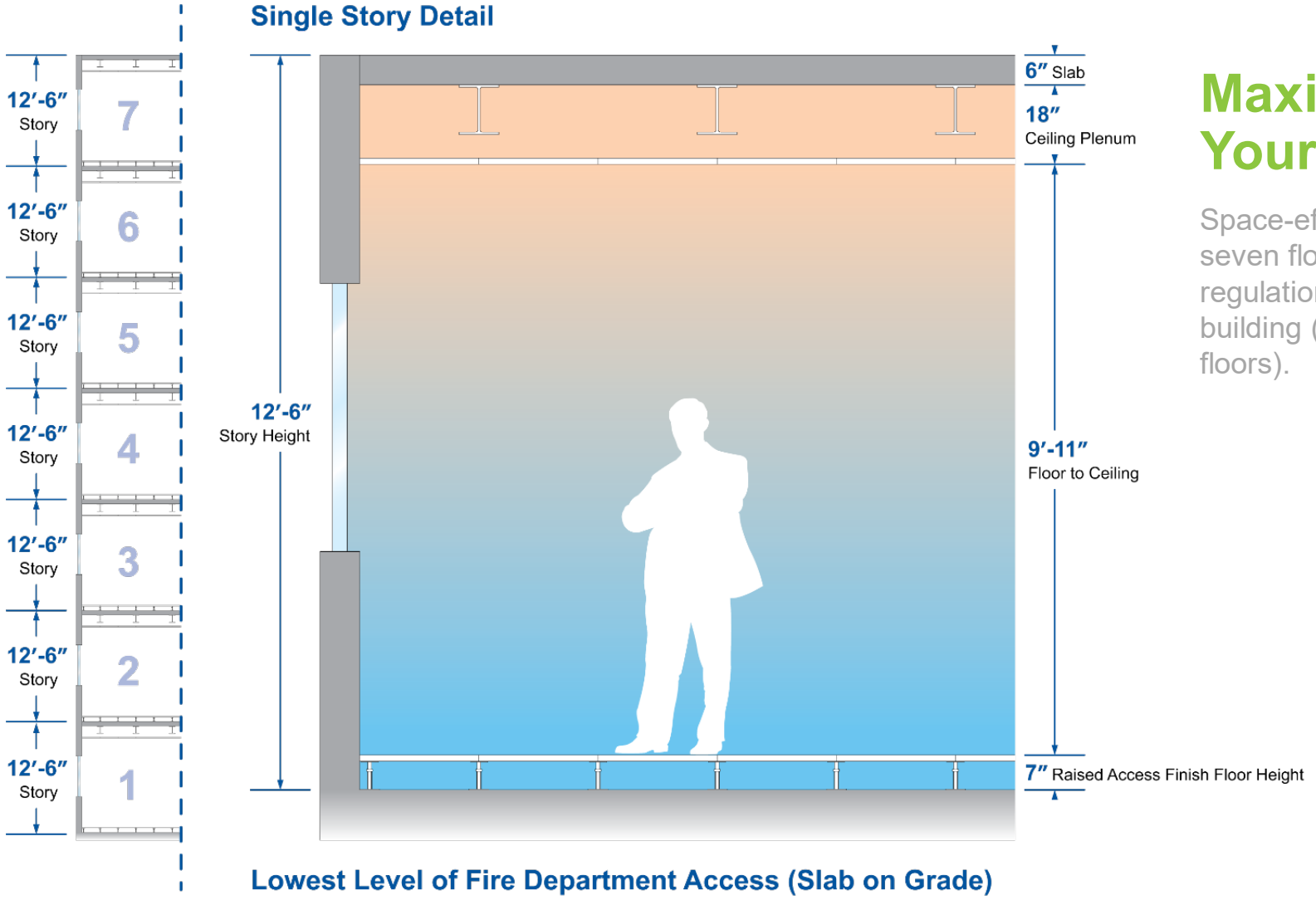
SCALE: ¼" = 1'-0"



How do you fit seven stories into a six-story space?

(Hint… the answer is **UFAD!**)

Stay Low-Rise: Turning Six Stories into Seven!



Maximize Your Real Estate!

Space-efficient UFAD allows seven floors to fit within the regulation height of a low-rise building (typically limited to six floors).

Stay Low-Rise: Turning Six Stories into Seven!

Developer Cost Savings

COST REDUCTION

12” Reduction in Floor to Floor Building Height:

- Cost PSF of Façade ≈ $125

Includes windows, steel, concrete, paint, drywall

Assuming a 10 story, 200,000 SF builing, first cost savings can be ≈ $75,000/Floor * 10 = $750,000

NET RENTABLE SPACE SAVINGS

- Air Towers can cut in half the mech room required

- Resulting in up to a 10% reduction in the BOMA Loss Factor for a building

- For every 150 sf returned as net rentable SF, for a typical 20,000 SF floor plate, there is an annuity of $.30 psf PER YEAR

Building Valuation (Simplified) I = p * s * h
Where:
I = revenue from the sale of property
P = the price of 1 sf of useable floor area
S = the useable area of one floor
H = the number of floors

Completely Wireless!!

NEW
products

Prestige wireless
diffusers

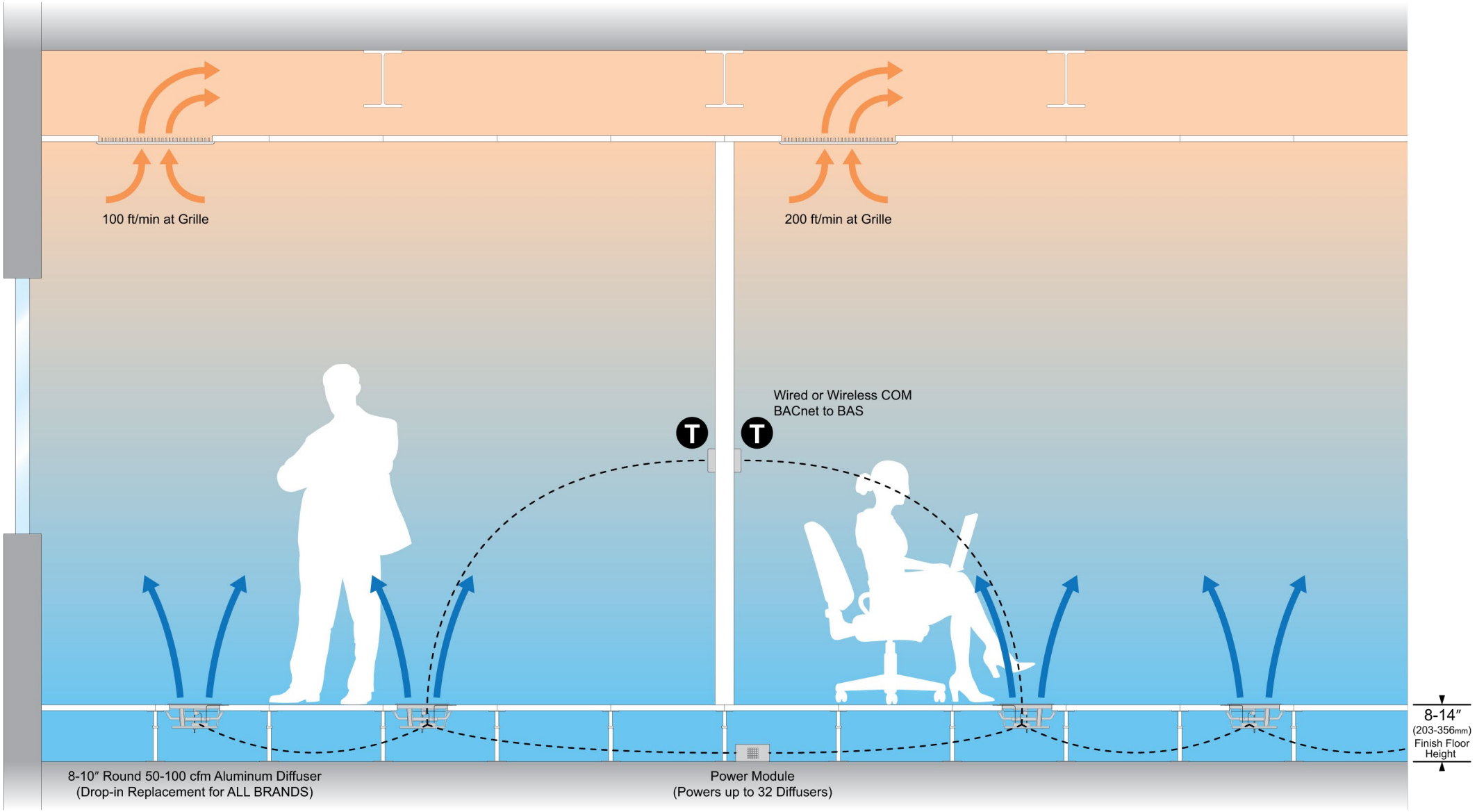
Prestige

Completely Wireless!!

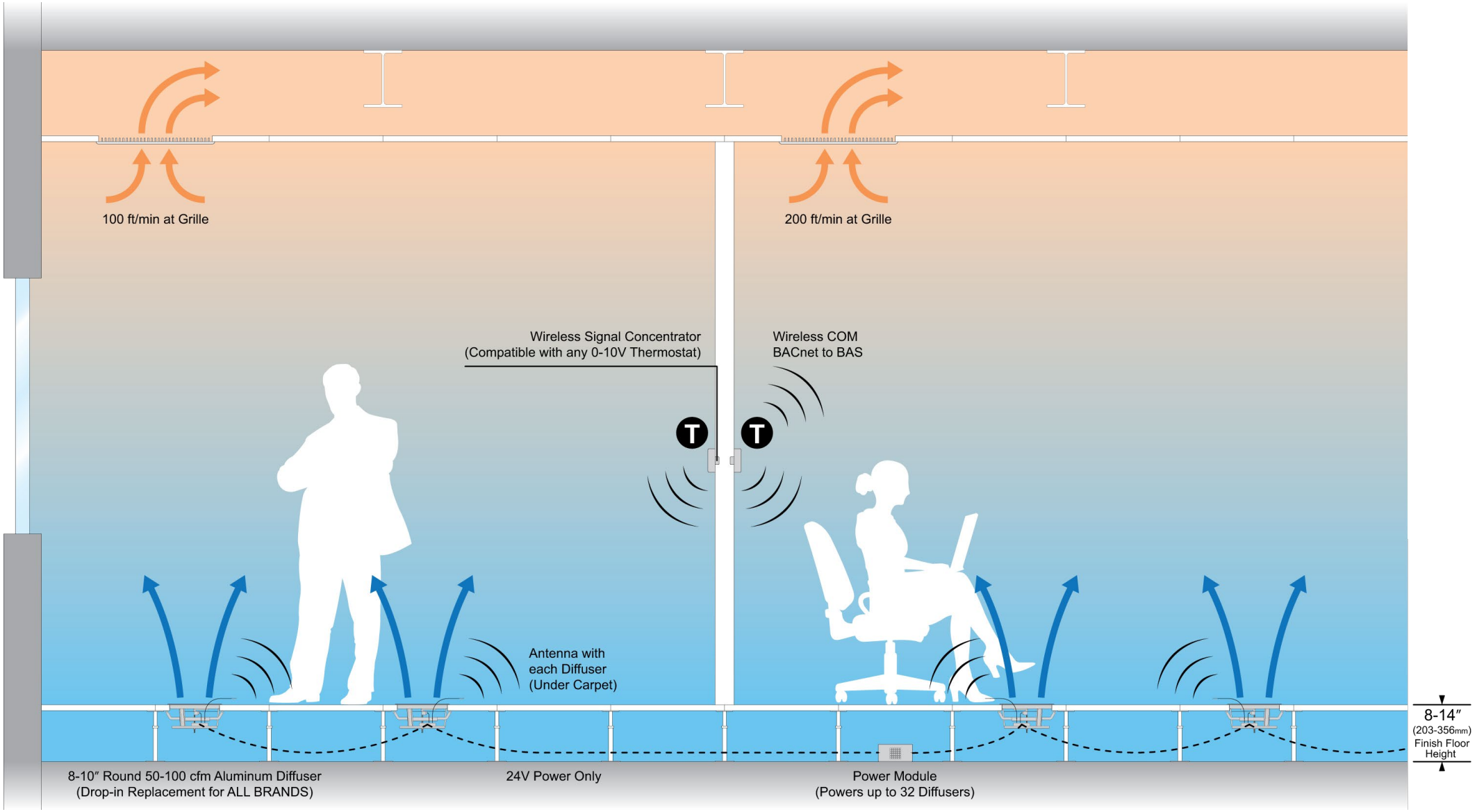
Prestige Features:

- Thermostat Controlled Motorized Diffuser Plate
- User-Controlled Manual Damper
- Unobstructed Zones of Over 300 feet
- Up to 32 Diffusers per Concentrator
- Projected 10-year Battery Life (Ultra-Low Power Consumption)
- 5 years Parts and Labor Warranty
- Ships Fully Assembled; Quick & Easy Install

Prestige



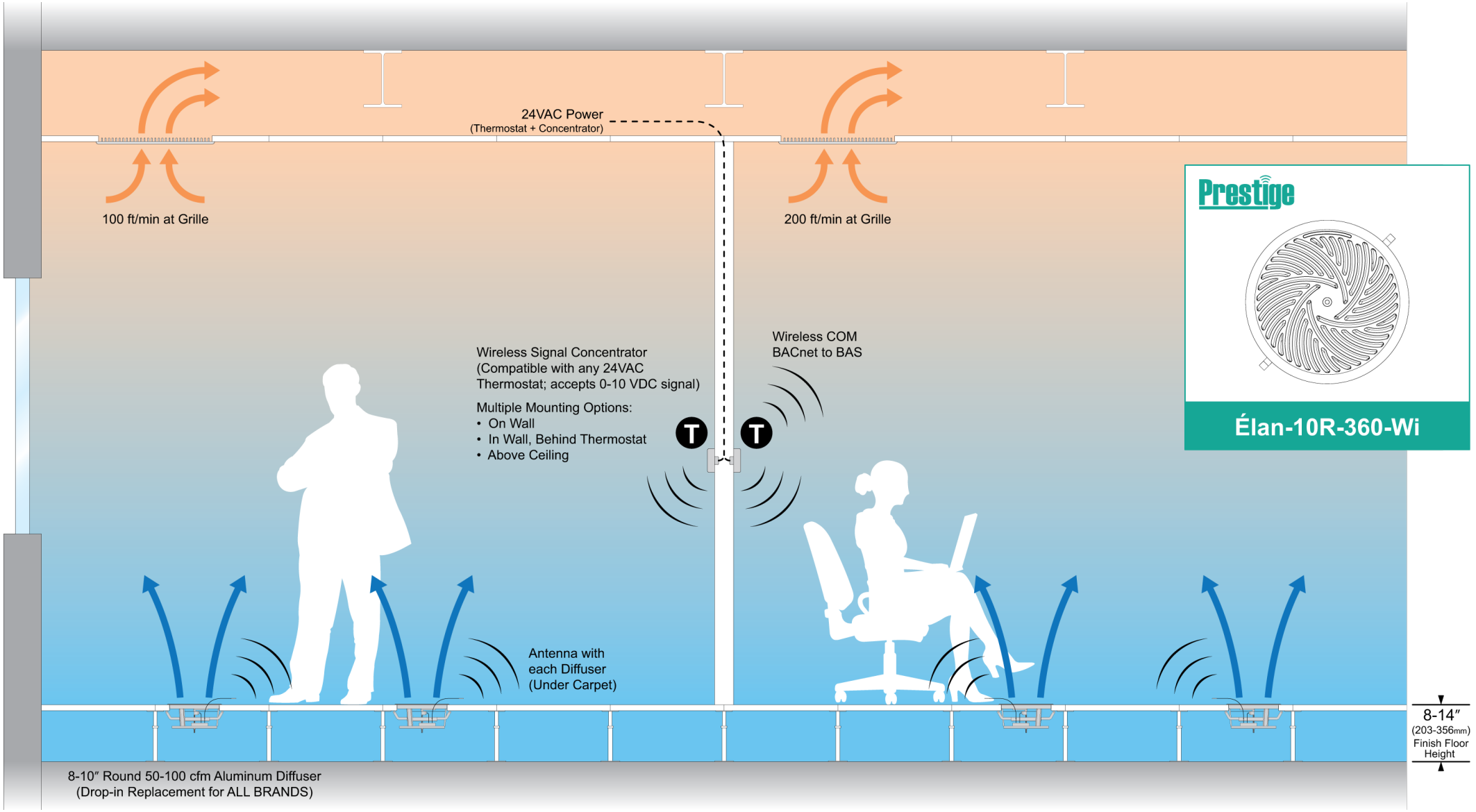
System 17: Drop-in VAV cooling with wired power and controls.



System 18: Drop-in VAV cooling with wired power / wireless controls.

AirFixture®

Typical UFAD System Designs



System 19: Drop-in VAV cooling with fully wireless power and controls.