Vertical Transportation Analysis

General Description

Soundscape is an exclusive office space developed by SHVO in Miami Beach. It contains about 38,000 gross square feet of office space on five levels with the second and third floors divided between parking and office space. Outdoor spaces are planned throughout the building including on the roof. It is planned as a creative-Tech office with an open flexible floorplan that integrates indoor and outdoor spaces.

The current plans show 3 elevators in-line serving all landings with a wall at the ground floor lobby separating the 2nd and 3rd elevators working west to east. As a result, there will be two groups of elevators – a two-car duplex passenger elevator group and a single dedicated service elevator.

Current planning indicates relatively large passenger-shaped elevators for the passenger and service cars, which translates to a 4,000 pound-capacity in lieu of the standard 3,500-pound capacity commercial office building elevator. Information presented in this report will be based on 4,000 pound-capacity passenger elevators. If space planning constraints dictate reducing the elevator shaft sizes, as a rule-of-thumb, 3,500-pound capacity elevators require 1’ 0” less width of the hoistway than 4,000 pound-capacity elevators.

All three elevators share a common corridor above the ground floor. The current architectural drawings show all three elevators with matching center-parting doors. FS2’s preference for service elevators is that they be “Service-Shaped” meaning they are deeper than they are wide rather than the “passenger-shaped” elevator – wider than it is deep- currently shown for the service elevator. Our primary recommendation is that the core be reconsidered to fit a service-shaped service elevator that is separated from the passenger elevators.

If the current core arrangement is maintained and a passenger-shaped elevator is used as the service elevator, we recommend that its door be made side-opening for improved functionality. For example, a sheetrock dolly with 8’ 0” boards on it will not fit in a 4,000-pound capacity elevator with center-opening doors, but it will fit in the same sized elevator with side-opening doors. The implication of changing the door arrangement for the service elevator is that the differences in the door types would be evident on levels above the ground floor, as the center-opening doors are important for the efficiency of the passenger elevators. The different door arrangements could help differentiate the function of the two elevator groups for tenants and encourage them to use the passenger elevators for normal circulation, as intended.

Since the building is a high-rise, the passenger & service elevators will require hoistway opening protection per FBC 3006.2, complying with 3006.3, which requires an enclosed elevator lobby or hoistway pressurization.

The parking levels are accessed by two automobile lifts, which will be 8,000-pound capacity roped holeless hydraulic class B autolifts. To maintain the required overrun below the 4th floor slab, the cab and door opening height will be 7’ 6”. This will accommodate luxury SUVs and even relatively tall non-commercial truck vehicles such as a Mercedes Sprinter Van with the tall roof option at 79”. It is unclear from current plans whether the intent is for the parking levels to be exclusively valet-operated - or whether there will be self-parking with tenants using the autolifts – an item to be clarified by Ownership. In either case we recommend that a remote-

control call and landing signals system be integrated with the elevator controls to manage queuing in the relatively tight vehicle maneuvering spaces in the parking levels. Refer to Appendix E for more details.

Executive Summary – Passenger Elevator Vertical Transportation

The passenger and service elevators will be the machine-room-less (MRL) type. Because of relatively small commercial office floorplates which is inefficient for elevator service, the Soundscape elevators are required to be 350 FPM – refer to Appendix A for a performance comparison of 350 versus 200 FPM. Excellent service will be provided by two 350 FPM machine-room-less traction elevators during morning up-peak with Good service levels provided during peak lunchtime traffic.

A central question influencing the shaft space planning and basis-of-design for the elevators is the degree to which the elevator finishes will be customized in the design scheme. The primary OEM elevator manufacturers (Otis, Schindler etc.) have engineering limitations as to the degree their MRLs can be customized. Independent MRL manufacturers follow a process that allows a greater degree of customization, but their MRLs require more space than the OEMs. These details are discussed in detail below under *Basis of Design* and specific planning dimension options and trade-offs are found in Appendix D. To further develop the elevator spatial planning, Ownership will have to provide direction as to which basis of design path to follow for Soundscape – OEM vs. Independent?

Design Criteria

The primary factor in determining the number of passenger elevators is the estimated population that will require vertical transport during peak traffic periods. For Soundscape using an occupant density of 125 ft^2/person net usable area produced a theoretical occupancy of 261 persons based on a total of 33,175 NUSF as provided in gross area calculations by Kobi Karp Architects with an 85% assumed efficiency of gross to usable. To calculate requirements for elevator usage a "diversity" or absentee factor of 10% is subtracted from the theoretical population to account for the fact that every workstation is not occupied every day due to absence resulting from telecommuting, illness, business travel or vacation. This results in a net population requiring elevator service for 234 persons. The calculations are summarized below:

SOUNDSCAPE - VT POPULATION CALCULATION							
FLOOR	F/F'	ELEVATION NGVD'	GROSS SF OFFICE	USABLE SF OFFICE (85%)	125 SF/P	DIVERSITY FACTOR (10%)	NET VT POPULATION
R		93.00					
6	13.67	79.33	9,174	7,798	62	6	56
5	13.58	65.75	9,334	7,934	63	6	57
4	13.58	52.17	9,334	7,934	63	6	57
3	13.58	38.58	5,177	4,400	35	4	32
2	13.58	25.00	5,294	4,500	36	4	32
G	19.5	5.50					
		87.50	38,313	32,566	261	26	**234**

The Vertical Transportation Analysis calculations used a criterion of 12% for the peak 5-Minute Handling Capacity for one-way morning up-peak and a 11% Handling Capacity for two-way lunchtime peak based on a diverse-tenant occupancy, which encompasses full-floor and multi-tenant floor occupancy. The design criterion for good elevator service is an Average Interval of 30 seconds resulting in an Average Waiting Time of 25 seconds or less. Thus, the requirements are the passenger elevators to serve 28 people during the busiest 5-minute period during the morning up-peak and to serve 26 people during the busiest 5-minutes during lunchtime.

Prevailing elevator codes for the project include:

- Florida Building Code, 2020 Edition
- IBC 2018, Florida Edition
- Florida Elevator Safety Code
- Safety Code for Elevators and Escalators, A17.1 – 2016
- Americans with Disability Act / A117.1-2017

Analysis Results

Based on the developed populations and Design Standards, FS2 completed Vertical Transportation analysis calculations for the passenger elevators for morning up-peak and two-way lunchtime peak. The results are summarized below.

Elevator Application	Average Waiting Time	Service Quality
2 x 4,000 lb. @ 350 FPM Morning Up-peak	18.7 Sec.	Excellent
2 x 4,000 lb. @ 350 FPM Lunchtime-peak	22.4 Sec.	Good

Detailed Vertical Transportation Analysis calculation results are in Appendix A. Industry-standard vertical transportation design and performance criteria are in Appendix B and vertical transportation analysis term definitions are in Appendix C.

Basis of Design

Passenger & Service Elevators

Based on the vertical travel distance, required size and speed of the elevators required to achieve the performance results outlined above, MRL elevators are the logical choice based on today's elevator product offerings. MRL elevators can be broadly classified into two categories, each having pros and cons for Soundscape.

The major OEM elevator manufacturer's MRL equipment have the following general characteristics:

- Compact core envelope (hoistway, pit, overhead).
- Custom cab interior finishes possible within strict weight limits for walls and suspended ceiling.
- Limited options for cab flooring recess – typically 1-1/4" maximum floor material depth. Weight of flooring material considered within overall limit combined with cab finishes.
- Standard stainless steel metal finishes for elevator fixture panels & pushbuttons.
- Standard stainless steel or paint grade finishes and standard frame profile for elevator entrances.
- Competitive installation cost.
- Proprietary control systems.

The OEM manufacturers and products that can be considered as the MRL basis of design for the Soundscape are as follows:

- ✓ Kone – Monospace 500
- ✓ Otis – Gen3 Edge
- ✓ Schindler – 5500
- ✓ Thyssenkrupp – Evolution 200

Alternatively, independent elevator installers using equipment manufactured by Hollister-Whitney and other specialized suppliers of cabs, fixtures and controls can be used as the basis of design. This equipment has the following characteristics:

- Larger core envelope (hoistway, pit, overhead).
- Customizable cab interiors with greater weight limits.
- Customizable flooring, metal finishes, entrance details.
- Premium installation cost.
- Non-proprietary control systems.

Appendix D shows core planning dimensions for two Schemes. Passenger-and Service-shaped elevators are included. If a passenger-shaped elevator shaft is selected for the service elevator, the passenger elevator dimensions can be used for the service elevator, and the 4,500-pound capacity service elevator dimensions ignored.

- Scheme 1 shows core planning that represents a combined worst-case that can accommodate 4 OEM manufacturer's equipment.

- Scheme 2 shows the alternative arrangements from Hollister-Whitney that meet the design criteria. All the arrangements shown are available as planning options. If the Ownership/Design Team prefers a non-proprietary control system with more custom finish options available than an OEM solution, space planning trade-offs between hoistway, pit and overhead dimensions should be considered by the Design Team to select the Plan arrangement most suitable.

Autolifts

Acceptable hydraulic equipment manufacturers are Minnesota Elevator Inc. (MEI), Canton Elevator or Mongrain Vertical Transport (MVT). The acceptable freight door and cab manufacturer is The Peelle Company. It is optional to add the remote-control call and signal features in Appendix E, which can be utilized by valets or self-parkers, depending on how that is handled operationally. The hoistway size outlined below is standard for automobile lifts. A reduction in the overall length of the hoistway could be considered based on the type of vehicles to be served in Soundscape's parking levels. Standard characteristics are outlined below:

- ✓ 8,000# capacity @ 125 FPM.
- ✓ Clear hoistway - 12' 0" wide x 22' 6" deep.
- ✓ Door opening: 9' 0" wide x 7' 6" high.
- ✓ Pit: 4' 6" Deep.
- ✓ Clear overhead: 12' 3" (as given) - the equipment needs 12' 0" minimum clear based on the 7' 6" cab/door height and a 2-speed gate on the cab. A 9,000# capacity hoistbeam is required at the top of the hoistway which will be removable after the cab is installed to yield the net 12' 0" + clear overhead.
- ✓ Each elevator will have two 75hp pump motors. The machine room will require about 200SF to accommodate the two 10' long x 3' 6" deep x 6' 0" power units, elevator controllers, freight door controllers and associated electrical disconnect switches. The room should be roughly square – approximately 16' x 12'.
- ✓ Heat load will be approximately 40,000 BTU/h per elevator to be maintained at <=95F @ 90% max non-condensing.

Elevator Products to address Covid 19

In the time since Covid 19 impacted life in the US, the elevator industry has responded with products to mitigate the spread of airborne viruses in in elevators. Each is briefly outlined below, with greater detail found in Appendix E. The inclusion of any of these products in the elevator design is at the Owner's option.

The focus is on cab ventilation systems. There are three products currently on the market. Efficacy test results are available for each the cab ventilation systems described below.

- Ionization is offered by Otis and others. Otis' literature in Appendix E is representative. This product distributes ionized particles into the cab. Aerosols are attracted to the charged ion particles. When the ions attach to the aerosols, the viruses in the aerosols are neutralized by the ions. It is available in new installations with a cost of under $2,500 per elevator. Similar products are available from Schindler and independent 3rd party industry suppliers.

- Man-D-tec, well known in the industry as manufacturer of elevator cab fans, has adapted dual HEPA filters and a UVC germicidal light to one of their workhouse elevator cab fans. This arrangement takes in air from the hoistway, passes it through the filters and UVC light, and blows purified air down into the cab. It's worth noting that in the US cab fans typically exhaust air from inside the cab to the hoistway. Elevator cabs are required to have natural ventilation but not required by code to have a fan (other than glass observation cars), so the Man-D-tec arrangement is not contrary to code. The cost of

incorporating this system into a new installation is around $4,000 each.

- CEC Elevator Cabs located in the Bronx has developed its Sterilyft product. This system exhausts air from within the cab, passes it through a MERV 13 filter, into a UV-C germicidal light plenum, through another MERV 13 filter and then ducts the purified air down the side of the cab and returns it to the cab at the base. The cost of installing this system in a new installation is around $8,000 per cab.

The UV light/filter systems require periodic maintenance to replace filters – twice/year and UV bulbs every 3-5 years.

End of Report

APPENDIX A – VT ANALYSIS RESULTS

MORNING UP-PEAK

ELEVATOR ANALYSIS SUMMARY

NUMBER OF ELEVATORS	DUTY	LEVELS SERVED	PROJECTED VT POPULATION (PERSONS)	INDIVIDUAL CAR LOAD (PERSONS) (UP/DOWN)	5-MINUTE,A.M., 1-WAY PEAK ELEVATORING		MEETS THE DESIGN CRITERIA?
					AVERAGE INTERVAL (SECONDS)	GROUP HANDLING CAPACITY (PERSONS/PERCENTAGE)	
2	4,000LBS @ 200 FPM	G, 2 – 6, R	234	3.6 / 0	38.2	28 / 12.0 %	NO
2	4,000LBS @ 350 FPM			2.5 / 0	26.7	28 / 12.0%	YES

SUGGESTED DESIGN CRITERIA: OFFICE PASSENGER ELEVATORS – DIVERSE TENANCY
AVERAGE INTERVAL: ≤ 25-30 SECONDS
AVERAGE WAITING TIME: ≤25 SECONDS
GROUP HANDLING CAPACITY: ≥ 12%
MEASUREMENT PERIOD: ONE-WAY AM UP PEAK

NOMINAL ELEVATOR CAR LOADS (MAXIMUM 80%ANALYSIS LOADS)

CAPACITY	PERSONS
3500LBS	18-19 PERSONS
4000LBS	22-24 PERSONS

ACCELERATION/DECELERATION AND JERK RATES UTILIZED:

ACV³F MRL
☒ 2.3FT/SEC² & 4.8.FT/SEC³

ELEVATOR WAITING TIME ANALYSIS

NUMBER OF ELEVATORS	DUTY	LEVELS SERVED	AVERAGE WAITING TIME (SECONDS)	AVERAGE TIME TO DESTINATION (SECONDS)	PERCENTAGE OF HALL CALLS ANSWERED WITHIN:			SERVICE QUALITY
					≤30 SEC.	≤60 SEC.	≤90 SEC.	
2	4,000LBS @ 200 FPM	G, 2 – 6, R	26.7	46	67%	89%	97%	FAIR
2	4,000LBS @ 350 FPM		18.7	32	80%	96%	100%	EXCELLENT

TWO-WAY LUNCH PEAK

ELEVATOR ANALYSIS SUMMARY

NUMBER OF ELEVATORS	ARRANGEMENT	LEVELS SERVED	PROJECTED VT POPULATION (PERSONS)	INDIVIDUAL CAR LOAD (PERSONS) (UP/DOWN)	5-MINUTE,A.M., 1-WAY PEAK ELEVATORING		MEETS THE DESIGN CRITERIA?
					AVERAGE INTERVAL (SECONDS)	GROUP HANDLING CAPACITY (PERSONS/PERCENTAGE)	
2	4,000LBS @ 200 FPM	G, 2 – 6, R	234	1.9 / 1.9	43.1	26 / 12%	NO
2	4,000LBS @ 350 FPM			1.3 / 1.3	29.9	26 / 12%	YES

SUGGESTED DESIGN CRITERIA — OFFICE PASSENGER ELEVATORS – DIVERSE TENANCY

AVERAGE INTERVAL: ≤ 25-30 SECONDS

AVERAGE WAITING TIME: ≤28 SECONDS

GROUP HANDLING CAPACITY: ≥ 11%

MEASUREMENT PERIOD: TWO-WAY LUNCH PEAK

NOMINAL ELEVATOR CAR LOADS (MAXIMUM 80%ANALYSIS LOADS)

CAPACITY	PERSONS
3500LBS	18-19 PERSONS
4000LBS	22-24 PERSONS

ACCELERATION/DECELERATION AND JERK RATES UTILIZED:

ACV^3F MRL

☒ $2.3FT/SEC^2$ & $4.8.FT/SEC^3$

ELEVATOR WAITING TIME ANALYSIS

NUMBER OF ELEVATORS	ARRANGEMENT	LEVELS SERVED	AVERAGE WAITING TIME (SECONDS)	AVERAGE TIME TO DESTINATION (SECONDS)	PERCENTAGE OF HALL CALLS ANSWERED WITHIN:			SERVICE QUALITY
					≤30 SEC.	≤60 SEC.	≤90 SEC.	
2	4,000LBS @ 200 FPM	G, 2 – 6, R	32.3	54	60%	84%	95%	POOR
2	4,000LBS @ 350 FPM		22.4	37	74%	93%	99%	GOOD

APPENDIX B – VT DESIGN CRITERIA

Office Building
Single Deck & Double Deck Design Criteria

Average Interval	≤ 25 – 30 Seconds
Handling Capacity – Minimums	
Office Building Diversified Tenancy Mixed Tenancy Single Tenancy	 ≥ 12% of Zone Population Moved ≥ 13% of Zone Population Moved ≥ 14% of Zone Population Moved
Floor Densities	10 – 15m²/Person N.U.A. - International 125 - 150 Sq. Ft / Person, N.U.A.
Diversity Factor	10% – 20%
Average Time to Destination	≤60 Seconds of Less
Peak Period	A.M. Up Peak

Office Building
Average Waiting Time Design Criteria—Office Building

ELEVATOR GROUP SERVICE RATING	AVERAGE WAITING TIME (SECONDS)	PERCENTAGE OF HALL CALLS UNDER		
		30 SECONDS	60 SECONDS	90 SECONDS
Excellent	≤20	≥75%	≥98%	100%
Good	≤25	≥70%	≥95%	≥98%
Fair	≤30	≥65%	≥95%	≥96%
Poor	≥30	≤65%	≤92%	≤94%
Times indicated are for the all-day period, the peak hour (other than the morning up-peak period) and the peak 15 minutes may drop one category.				

APPENDIX C – VT DESIGN DEFINITIONS

Handling Capacity – The number of persons or percentage of population that can be transported by the vertical transportation system over a peak period; the peak period is the same period used to measure Average Interval.

Demand Interval – The time interval during which the peak demand vertical transportation will occur.

Average Interval – The average time between elevator departures from the main terminal loading floor, in seconds, during the peak period; calculated by dividing the round-trip time of a single elevator by the number of elevators proposed for the group.

Round-Trip Time - The theoretical average time for an elevator, based on the calculated individual car load, to leave the main lobby, transit through the local stops, discharge passengers and return to the lobby ready to pick up another load.

Individual Car Load – The number of persons carried on the elevator during the round-trip time calculation. Elevator Engineers rate the most-commonly used passenger elevator sizes as follows:

Elevator Size (lbs.)	Maximum Net Area (Ft^2)	Nominal Car Capacity (Persons)
2500	29.1	12-14
3000	33.7	16-17
3500	38.0	19-20
4000	42.2	22-24
4500	46.2	24-25

The nominal carloads work out to about 1.7 – 1.94 ft^2 per person with an average body ellipse, including the "no touch" barrier we all project in front of us. The calculated individual carload used for elevator analysis is based upon the group Handling Capacity required and the Average Interval desired.

APPENDIX D – OEM vs. Independent Mfr. VT Core Planning

SCHEME 1 - OEM

NON-SEISMIC	Mfr:	Kone	Otis	Schindler	tkE		BASIS OF DESIGN MULTI-MFR WORST CASE
	Product	Monospace 500	G3 Edge	5500	Evolution 200		
PASSENGER	4000 @ 350 MRL						
SHAPED	Hoistway	9' 8" x 6' 11"	9' 4" x 6' 11"	9' 6" X 7' 4"	9' 6" x 6' 11"		9' 8" x 7' 4"
	Pit	5' 6"	5' 6"	5' 5"	5' 6"		5' 6"
	Clear Overhead[1]	14' 6"	15' 7"	16' 11"	14' 4"		16' 11"
	Stretcher	Yes	Yes	Yes	Yes		Yes
	9' 0" CAB (MIN)						
SERVICE	4500H @ 200 MRL						
SHAPED	Hoistway	7' 8" x 9' 8"	7' 4" X 9' 7"	8' 5" X 9' 0"	7' 6" x 9' 6-1/2"		8' 5" X 9' 8"
	Pit	5' 0"	5' 0"	5' 1"	5' 0"		5' 1"
	Clear Overhead[1]	14' 4"	14' 8"	14' 9"	13' 8"		14' 9"
	Stretcher	Yes	Yes	Yes	Yes		Yes
	9' 0" CAB (MIN)						

SCHEME 2 - HOLLISTER-WHITNEY

	Product	Plan 101	Plan 121	Plan 131	Plan 201	Plan 231
PASSENGER	4000 @ 350 MRL					
SHAPED	Hoistway	11' 3" x 7' 2"	10' 8" x 7'0"	9' 10" x 8' 2"	10' 4" x 7' 0"	9' 4" x 8' 2"
	Pit	7' 10"	6' 2"	6' 4"	5' 8"	5' 8"
	Stretcher	Yes	Yes	Yes	Yes	Yes
	Clear Overhead[1]	15' 11"	19' 2"	19' 2"	20' 10"	20' 10"
	9' 0" CAB					

SERVICE			
SHAPED	4500H @ 200 MRL	Plan 111	Plan 211
	Hoistway	9' 1" x 9' 9"	8' 6" x 9' 9"
	Pit	7' 0"	5' 6"
	Clear Overhead[1]	15' 4"	20' 3"
	Stretcher	Yes	Yes
	9' 0" CAB		

1) For top of Elevator Bulkhead, add 10" for Hoistbeam and 8" for Structure to Clear Overhead

APPENDIX E – REMOTE CONTROL SYSTEM FOR AUTOMOBILE LIFTS

VMI Elevator Remote Control System

REMOTE CONTROL FREAKS

VMI's elevator remote control system is designed to give a passenger the ability to call an elevator to a floor with a small hand held keyfob transmitter. A system can be custom designed and built to meet your needs.. Contact VMI and our engineers will work together with you to design your own unique system.

Operation

- User presses a button to call the elevator to the corresponding level
- The Status Indicator signals whether the elevator will be arriving loaded (RED) or empty (GREEN).
- The RED indicator begins flashing as a warning while the elevator doors are closing.
- An elevator that is loaded and has its door fully closed will automatically dispatch to the other landing.
- Doors will automatically open upon arrival and automatically close after the vehicle has exited the elevator.

Two Stop Auto-Dispatch System shown in example

Status Indicator

None:	Empty elevator is available for transport
Green Flashing:	Empty elevator is opening doors after responding to a call.
Green Steady:	Empty elevator is responding to a call or is ready to load for transport.
Red Flashing:	Doors are closing or about to close.
Red Steady:	Loaded elevator is in transport or about to unload. Waiting vehicles should stay clear of door to allow vehicle to exit.

Components Included

Key Fob Transmitter (1 per user), Receiver Unit located at each landing
Status Indicator Units, Load Weighing Device (1)
VMI Controller with Auto Dispatch Software

Toll Free: (888) 864-3683
sales@vertitron.com
www.vertitron.com

VERTITRON MIDWEST, INC.
19336 607th Ave
Mankato, MN 56001

APPENDIX F – ELEVATOR DESIGNS TO ADDRESS COVID 19

Otis Product Information

Otis Cab Air Purifier

REDUCE THE SPREAD OF BACTERIA AND VIRUSES IN YOUR BUILDING

The new Otis Cab Air Purifier uses bipolar ionization technology, significantly reducing airborne bacteria and viruses in your elevator.

IONIC AIR PURIFICATION TECHNOLOGY

The Otis Cab Air Purifier generates millions of positive and negative ions that are circulated through the air using your existing fan.

The ions attach to bacteria, viruses and microbes in the air, causing a chemical reaction. This degrades and neutralizes the harmful pathogens, helping to reduce the spread of infection.

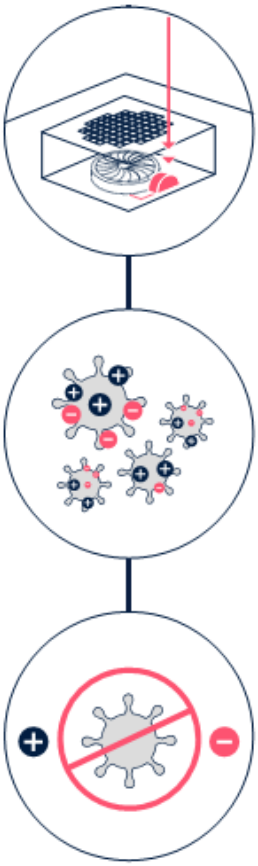
EASY INSTALLATION & OPERATION

Otis will modify your existing exhaust fan to an intake fan and add the Otis Cab Air Purifier. The unit continuously purifies air without having to be charged, refilled or cleaned outside of regular elevator maintenance.

AIR PURIFICATION AND COVID-19

Although not tested directly against SARS-CoV-2, the virus causing COVID-19, the Otis Cab Air Purifier has demonstrated effectiveness against viruses similar to the novel coronavirus, both in air and on hard surfaces.

This device was effective in disinfecting MS2 bacteriophage, an EPA-approved surrogate for SARS-CoV-2, in a government-approved lab.



1. Attached to your modified fan equipment, the Otis Cab Air Purifier generates both negative and positive ions.

2. The ions attach to viruses, bacteria and other microbes, causing a chemical reaction that degrades them.

3. Harmful pathogenic microbes are neutralized, reducing the spread of airborne infection.

Microorganism	Species	Facility	Year
Viruses	MS2 Bacteriophage	INTA, IT	2020
	Influenza A (H1N1)	Kitasato Research Center, JP	2011
Bacteria	S. aureus	EMSL Analytical, US	2011
	P. aeruginosa	Istanbul University, TR	2011
	S. epidermidis	ARE Labs, KS, US	2011
	E. coli	EMSL Analytical, US; Istanbul University, TR	2011

The Otis Cab Air Purifier is also effective against molds, fungi and spores.
For a full list of testing results, please contact your local sales representative.

Man-D-Tec Product Information

Man-D-Tec

MVSUVHC
REVISION: B
EFFECTIVE: 8/2020

MVS®-UVHC™

UVC GERMICIDAL DUAL HEPA FILTRATION UNIT

LABORATORY TESTED!

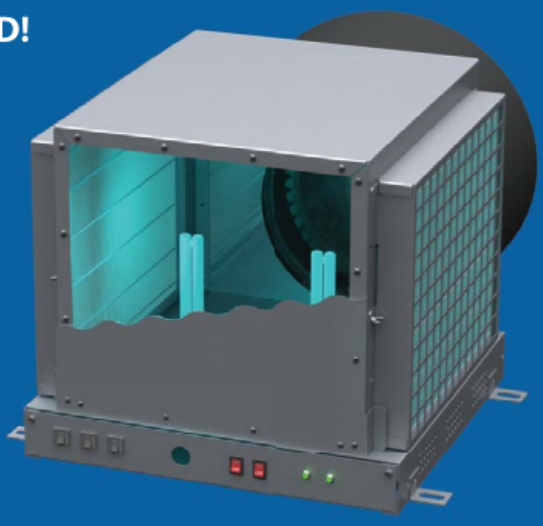
PROVEN
to remove 99.9%
of airborne virus particles!

Removes 97.9% of virus particles in **60 SECONDS**

Removes 99.5% of virus particles in **120 SECONDS**

Based on 250 Cubic Foot test chamber (70" x 70" x 88" H)

See Microbiological Laboratory report for details



Shown with end panel partially removed

PATENTS PENDING

Dual UVC Germicidal Sources

Dual HEPA Filtration
MERV 17 (True HEPA)
up to 99.97% @ 0.3 Micron

Safety Listed to meet A17.5 Elevator Code Requirements!

Intertek 5018183

Conforms to: ASME A17.5 (2019)
Conforms to: UL508 (2018)
Certified to: CSA B44.1 (2019)

VENTILATION / FANS

MVS-UVHC by Man-D-Tec

FOR NEW AND EXISTING ELEVATOR CABS

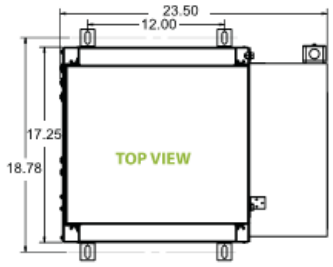
MVS®-UVHC™

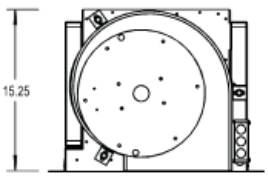
Patent Pending, Ultra Performance, Dual UVC Germicidal & Dual HEPA filtration unit. Built specifically for elevators and **PROVEN to remove 99.9% of airborne virus AND bacteria particles.** This unit features a 3-speed high performance sealed ball bearing motor. The "squirrel cage" blower wheel ensures maximum air flow and quiet operation. **Blows purified air down into the cab.**

Proprietary, fully automatic UV performance monitoring system ensures the dual UVC Germicidal unit is performing at peak levels and has LED indicators for each UV source, along with audible notification when system needs attention.

COP remote mounted UV status indicators are available. This allows passengers to visually see that the system is operating, giving them confidence that their safety is a high priority.

FOR OPTIONS SEE
ACCESSORIES





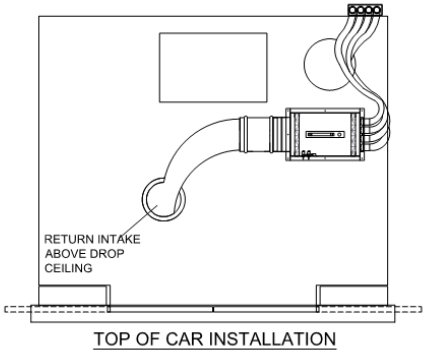
SIDE VIEW

MADE IN USA OF US & IMPORTED PARTS

Intertek 5018183

1.800.944.6263
WWW.MANDTEC.COM

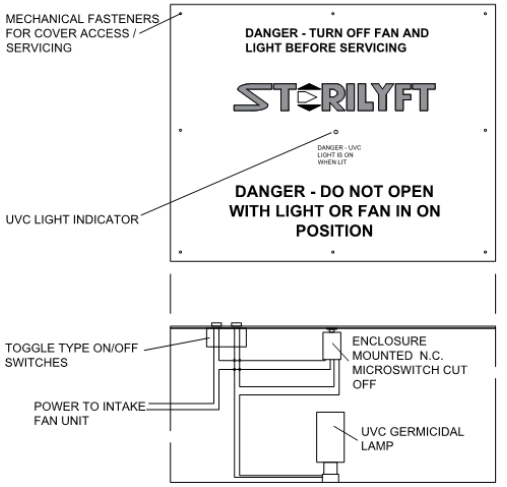
CEC Cab – Sterilyft Product Information

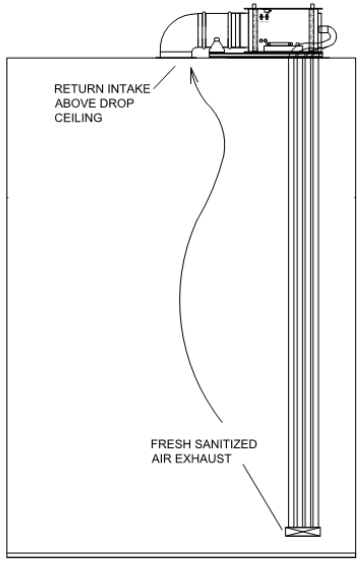


TOP OF CAR INSTALLATION

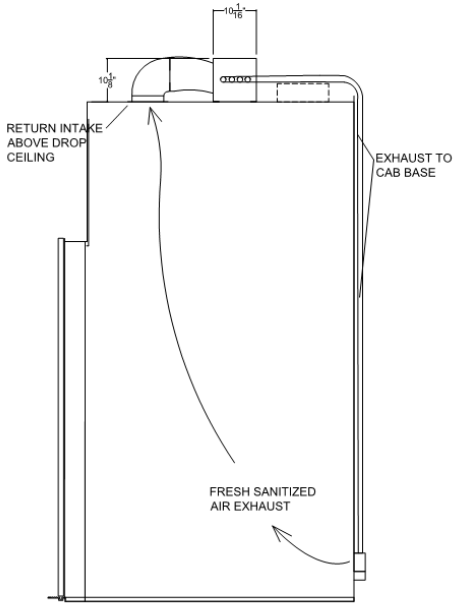
UNIT DETAIL AND DIMENSIONS

ACCESS SERVICE COVER DETAIL





FRONT VIEW OF INSTALLATION



SIDE VIEW OF INSTALLATION

CEC ELEVATOR CAB CORP
540 MANIDA STREET
BRONX, NY 10474
P - 718-328-3632 F - 718-328-3633

BUILDING
CEC CAB SANITIZER UNIT
ADDRESS
CUSTOMER
OWNER
ARCHITECT
ELEVATOR CONSULTANT
ELEVATOR CONTRACTOR

DATE	DRAWN BY	CHECK BY	DRAWING #
4/20/20	NICK G		