CAPE MEMORY CARE

A WOODLANDS SENIOR LIVING COMMUNITY

Woodlands Senior Living of Cape Elizabeth, LLC located at 126 Scott Dyer Road is proposing to replace the existing outdoor air ventilation system with a new unit. The new unit will sit on a steel structure on top of a cement base and attach to the building through a new gable roof. The new outdoor air ventilation system will not extend above the existing roof line.

Regards.

Jon Barrett

Director of Facilities Maintenance Consulting

Woodlands Senior Living

126 Scott Dyer Road • Cape Elizabeth, Maine 04107 • Phone (207) 553-9616 • Fax (207) 553-9618

www.capememorycare.com

Print Form

TOWN OF CAPE ELIZABETH
Planning Board Application

Applications for Planning Board Review shall be submitted to the Town Planner. Applicants should contact the Town Planner prior to submitting an application to confirm submission requirements.

Applicant:

Name: Woodlands Senior Living of Cape Elizabeth, LLC. Telephone: 872-8992

Address: 141 West River Road Waterville, ME 04901 Email: mwalters@woodlandsmaine.cc

Agent or Contact Person to whom all correspondence should be addressed:

Name: Jon Barrett Telephone: 872-8992

Address: 141 West River Road Suite 300 Fax: 872-8990

Waterville, ME 04901 Email: jbarrett@woodlandsmaine.com

Name of Project: Cape Memory Care HVAC Site Plan Amen Map/ Lot U45/004

Location: 126 Scott Dyer Road Cape Elizabeth, ME

Type of Review:

_____	Major Subdivision Review, Sec. 16-2-4, Subdivision Ordinance
_____	Minor Subdivision Review, Sec. 16-2-3, Subdivision Ordinance
X	Site Plan Review, Sec. 19-9, Zoning Ordinance
_____	Private Access Waiver, Sec. 19-7-9, Zoning Ordinance
_____	Earth Materials Permit, Sec. 19-8-5, Zoning Ordinance
_____	Resource Protection Permit, Sec. 19-8-3, Zoning Ordinance
_____	Other: _____

Fees Paid: $300.00

I attest that I have right, title, or interest in the property to be reviewed. I have reviewed a copy of the application regulations listed above and attest that I have read them and prepared my application in accordance with Town requirements.

Signature of Applicant

9/28/2020
Date

MECHANICAL SYSTEMS ENGINEERS, INC.
Royal River Center, Unit #10B
10 Forest Falls Drive, Yarmouth, Maine 04096
Tel. (207) 846-1441

September 14, 2020

TO Jon Barrett

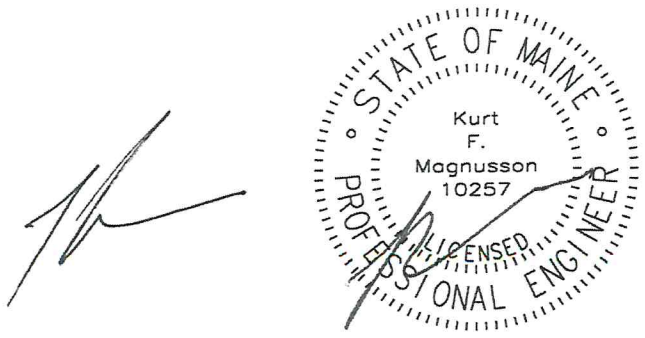
RE New Ventilation Unit -- Sound Data at Property Line
Cape Elizabeth Memory Care
126 Scott Dyer Road
Cape Elizbeth, Maine

The intention is to install a new Dedicated Outdoor Air Ventilation System to replace the existing Dedicated Outdoor Air System. The new unit will be significantly larger in dimensions that the existing system, however we calculate the existing sound level at the property line will not be increased over the existing sound level conditions.

The nearest adjacent property line to the new unit is 80' away. The information below was obtained by the Unit Manufacturer and the adjusted calculations for distance and combined sound power were developed by Mechanical Systems Engineers.

Above Air Model ROAD-AO-020S-3-Y60	Published Sound P0wer	Published Test Power	Test To Property Distance	Source To Property Line	Adjusted Sound Line
Supply Fan	78 dB(A)	5 ft	75 ft	80 ft	51 dB(A)
Exhaust Fan	83 dB(A)	5 ft	75 ft	80 ft	56 dB(A)
Condenser Fan 1	69 dB(A)	5 ft	75 ft	80 ft	42 dB(A)
Condenser Fan 2	69 dB(A)	5 ft	75 ft	80 ft	42 dB(A)
Compressor 1	68 dB(A)	5 ft	75 ft	80 ft	41 dB(A)
Compressor 2	68 dB(A)	5 ft	75 ft	80 ft	41 dB(A)
Compressor 3	68 dB(A)	5 ft	75 ft	80 ft	41 dB(A)
Compressor 4	68 dB(A)	5 ft	75 ft	80 ft	41 dB(A)

The Combined Sound Power of the components listed above at 80 foot from the new unit location is 57.7 dB(A) (a logarithmic calculation) which is well within the sound level limits established by the Maine Department of Environmental Protection.



Kurt Magnusson, P.E.

MECHANICAL SYSTEMS ENGINEERS, INC.
Royal River Center, Unit #10B
10 Forest Falls Drive, Yarmouth, Maine 04096
Tel. (207) 846-1441

September 27, 2020

TO Jon Barrett

RE Revised Sound Data with Sound Absorbing Elbow on Exhaust Fan and Sound Absorbing Insulation on Inside of Supply Fan Hood.

New Ventilation Unit -- Sound Data at Property Line
Cape Elizabeth Memory Care
126 Scott Dyer Road, Cape Elizabeth, Maine

The intention is to install a new Dedicated Outdoor Air Ventilation System to replace the existing Dedicated Outdoor Air System. The new unit will be significantly larger in dimensions that the existing system, however we calculate the existing sound level at the property line will not be increased over the existing sound level conditions.

We have added to the design a sound absorbing 30"x30" internally acoustically insulated elbow to the outlet of the Exhaust Fan and will be adding sound absorbing material to the inside of the hood for the supply fan The exhaust fan and supply fan are the noisiest components of the system and were the cause of the unit exceeding the nighttime 45 dB(A) at the property line in the original calculations.

Effect of Acoustically Insulated Elbow on Exhaust Fan Sound

Frequency	63 Hz	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz	8k Hz
Exhaust Fan	59	70	86	88	89	87	82	74
Acoustic Elbow	0	-1	-4	-13	-28	-14	-10	-8
Speed Correction	0	0	0	0	0	0	0	0
5' Test Correction	- 10	-10	-10	-10	-10	-10	-10	-10
Sound Pressure	49	59	72	65	51	63	63	56
"A" Scale Correction	-26	-16	-9	-3	0	1	1	-1
dB"A" Spectrum @ 5'	23	43	63	62	51	64	84	55

The Net Sound Power of the component (Exhaust Fan with Acoustic Elbow) listed above at 5 foot from the fan is 70 dB(A) (a logarithmic calculation),

Effect of Acoustically Insulating Hood on Supply Fan Sound

Frequency	63 Hz	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz	8k Hz
Supply Fan	50	60	80	81	85	83	76	71
Acoustic Hood	0	0	-2	-8	-16	-14	-9	-8
Speed Correction	0	0	0	0	0	0	0	0
5' Test Correction	- 10	-10	-10	-10	-10	-10	-19	-10
Sound Pressure	40	50	68	63	59	63	57	5
"A" Scale Correction	-26	-16	-9	-3	0	1	1	-1
dB"A" Spectrum @ 5'	23	43	63	62	51	64	84	55

The Net Sound Power of the component (Supply Fan with acoustic hood lining) listed above at 5 foot from the fan is 67 dB(A) (a logarithmic calculation),

New Ventilation Unit -- Sound Data at Property Line
Cape Elizabeth Memory Care
126 Scott Dyer Road
Cape Elizbeth, Maine

Calculation or Net Sound Level at 80' from Source to Property Line

The nearest adjacent property line to the new unit is 80' away. The information below was obtained from the Unit Manufacturer and the adjusted calculations for distance and combined sound power were developed by Mechanical Systems Engineers.

Above Air Model ROAD-AO-020S-3-Y60	Published Sound Power	Published Test Power	Test To Property Distance	Source To Property Line	Adjusted Sound @ 80'
Supply Fan (w/acoustic hood)	67 dB(A)	5 ft	75 ft	80 ft	40 dB(A)
Exhaust Fan (w/acoustic elbow)	70 dB(A)	5 ft	75 ft	80 ft	43 dB(A)
Condenser Fan 1	69 dB(A)	5 ft	75 ft	80 ft	42 dB(A)
Condenser Fan 2	69 dB(A)	5 ft	75 ft	80 ft	42 dB(A)
Compressor 1	68 dB(A)	5 ft	75 ft	80 ft	41 dB(A)
Compressor 2	68 dB(A)	5 ft	75 ft	80 ft	41 dB(A)
Compressor 3	68 dB(A)	5 ft	75 ft	80 ft	41 dB(A)
Compressor 4	68 dB(A)	5 ft	75 ft	80 ft	41 dB(A)

The Combined Sound Power of the components listed above at 80 foot from the new unit location is 46.9 dB(A) (a logarithmic calculation).

This Sound Level is less than Cape Elizabeth day maximum but over Cape Elizabeth night maximum requirement.

However, I have used worse case numbers and have not included all the mitigating circumstances. For example, for the total calculations I have assumed that all the eight noise sources are pointed directly at the closest property line – which they are not (only one is).

I believe we will not have any issue staying under the 45 dB(A) maximum. Also, during commissioning we will be lowering the fan speeds from the maximum from which the tests were done at the factory and this will significantly lower the Sound Level – I just cannot put an exact number on that at this time.

Kurt Magnusson, P.E.

Unit Tag	DOAS-1	Project	Cape Elizabeth Memory Care
Model	ROAD-A0-020S-3-T60	Engineer	Engineer
Quantity	1	Contractor	Contractor
Unit Type	Packaged Rooftop	AboveAir Rep	Aircon (Todd Flaherty)
Heat Type	Modulating Gas Heat	Date	6-Nov-19

Electrical Data

Main Power Supply	208/3/60
Name Plate Data*	108.6 FLA | 116.1 MCA | 125 MOP

Design Ambient Conditions

Summer	95.0°F DB / 78.0°F WB
Winter	-20.0°F DB

Design Space Conditions

Cooling	75.0°F DB / 62.5°F WB
Heating	70.0°F DB

Supply Air Fan Data

Total Airflow Rate	5,400 cfm
OA Airflow Rate	5,400 cfm / 100.0%
ESP / TSP	1.50 in w.g. / 2.56 in w.g.
Motor Power (each)	3.0kW
Input Power (each)	1.5kW
FLA (each)	7.8A @ 208/3/60
Fan Type	ECM Direct Drive BI Impeller
Fan Quantity	2

Energy Recovery Wheel Data

Wheel Construction	Desiccant Coated Aluminum
Wheel Control	Variable Speed

Energy Recovery Cooling Performance

Outside Air	95.0°F DB / 78.0°F WB
Supply Air	81.4°F DB / 68.5°F WB
Return Air	75.0°F DB / 62.5°F WB
Exhaust Air	88.6°F DB / 73.2°F WB
Recovered (Total)	206.8 MBh
Eff. (Total)	0.7
Eff. (Sensible)	0.7

Cooling Coil Data

Capacity (Total)	242.6 MBh
Capacity (Sensible)	151.3 MBh
Mixed EAT	81.4°F DB / 68.5°F WB
Coil LAT	55.6°F DB / 53.9°F WB
Condensate Flow	87.4 lb/hr
Face Area / Rows / FPI	19.1ft² / 6 / 12
Construction	Aluminum Finned, Copper Tube

Modulating Hot Gas Reheat Coil Data

Capacity	192.3 MBh
LAT* (@ Max Output)	88.4°F DB / 65.7°F WB
Face Area / Rows / FPI	18. ft² / 2 / 12
Construction	Aluminum Finned, Copper Tube

*Set point adjustable to space neutral (e.g. 72°F)

Compressor Data

Type / Quantity	Tandem Scroll / 1
RLA (C1 / C2 / C3 / C4)	30.1 / 30.1 / - / -
Total Power	15.9kW
Control	Digital + Fixed Speed
Refrigerant Type	R-410a

Condenser Coil Data

THR (Btu/hr)	297,040
Face Area / Rows / FPI	36.6 ft² / 6 / 16
Construction	Aluminum Finned, Copper Tube

Condenser Fan Data

Airflow	16,000 cfm
Motor Power (each)	3.1kW
FLA (each)	8.0A @ 208/3/60
Fan Type	ECM Direct Drive Axial
Fan Quantity	2

Exhaust Air Fan Data

Airflow	5,400 cfm
ESP / TSP	1.50 in w.g. / 1.90 in w.g.
Motor Power (each)	3.3kW
Input Power (each)	1.1kW
FLA (each)	8.4A @ 208/3/60
Fan Type	ECM Direct Drive BI Impeller
Fan Quantity	2

Preheat Data

Capacity	N/A
LAT	N/A
FLA	N/A
Type	N/A

Heat Pump Data (Locked Out @ 45°F MAT)

Capacity at 47°F	N/A
LAT at 47°F	N/A
Capacity at 17°F	N/A
LAT at 17°F	N/A

Energy Recovery Wheel Data

Energy Recovery Heating Performance

Outside Air	-20.0°F DB / -21.0°F WB
Supply Air	41.0°F DB / 41.0°F WB
Return Air	70.0°F DB / 60.0°F WB
Exhaust Air	8.8°F DB / 8.8°F WB
Recovered (Total)	382.1 MBh
Eff. (Total)	0.7
Eff. (Sensible)	0.7

Heating Data

Capacity	400 MBh
Mixed EAT	41.0°F DB
LAT	95.5°F DB
Type	10:1 Modulating Gas Heat
Min/Max Pressure	6.0 /13.5 in w.g.
Requires field mounted	fire stat

Air Filtration Data

Pre-Filter	Qty (8) 16x25x2 MERV 8
Final Filter	Qty (8) 16x25x4 MERV 13
Outside Air Hood	Qty (4) 26x30x2 Metal Mesh
Exhaust Air	Qty (3) 16x25x2 Metal Mesh

Connection Data

Condensate Drain	1-1/4 NPT
Supply Air	See attached cut sheet
Exhaust/Return Air	See attached cut sheet
Duct Configuration	Side Discharge
Gas Heat	

Physical Data

Exterior	Powder-Coat Painted Steel
Construction	Double Wall, 2" Foam R-13 Min
Dimensions	See attached cut sheet
Weight	7,334 lbs. ± 5%

Coil Coatings

- Supply Air Coils - No Coatings
- Condenser Coil - No Coatings

Factory Installed Optional Accessories

- BMS Card
- Modulating Hot Gas Reheat Valve
- Voltage/Phase Monitor
- Compressor Sound Jacket(s)

Field Installed Optional Accessories

- Disconnect
- Field Wired 115V Convenience Outlet (wired by others; requires field provided separate power source)

Factory Warranties

- 1 Year Limited Parts Warranty

Control Features

- MC-Series Advanced Microprocessor Control w/ Alarms
- Human Interface Display (HID) & Service Cable

Sequence of Operations

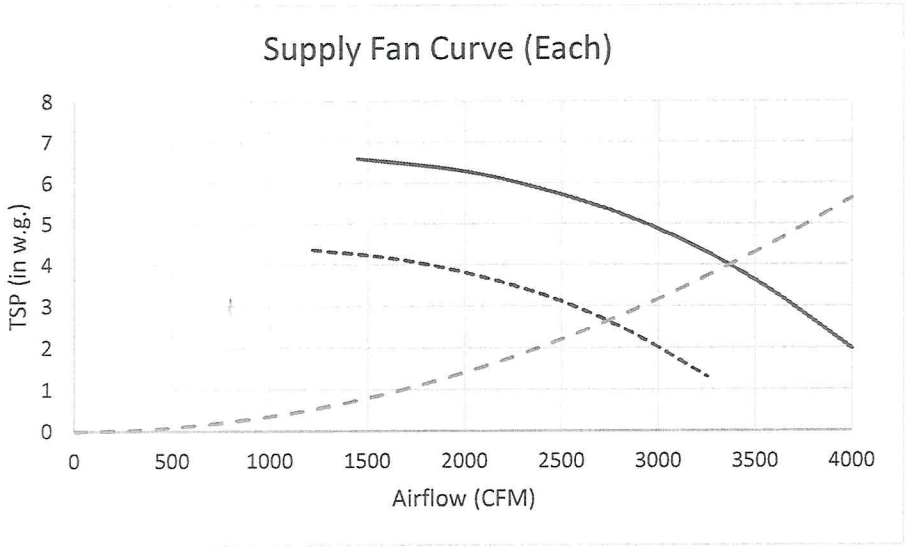
Neutral Makeup Air - Constant Volume

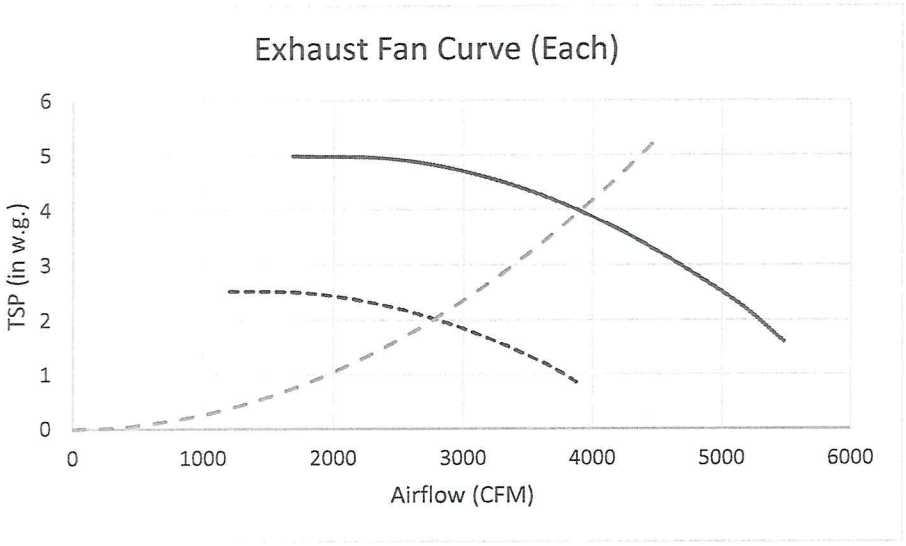
Sensor Configuration

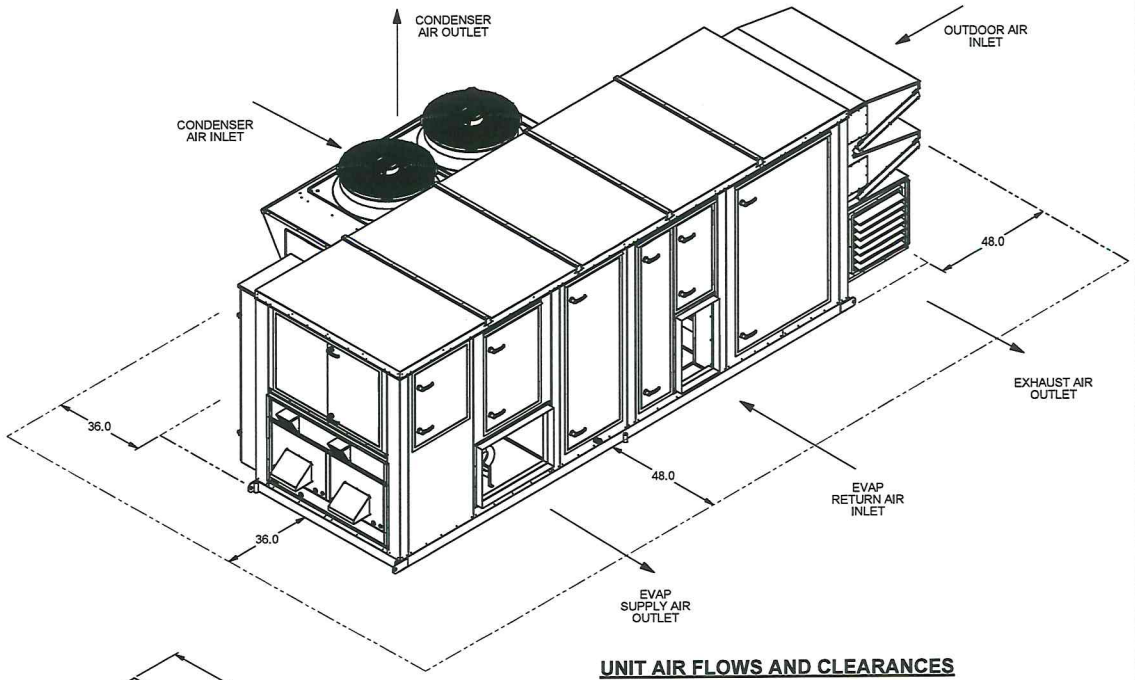
- Mixed Air Dew Point - Factory Mounted
- Supply Air Temperature - Field Mounted
- DX Coil Temperature - Factory Mounted
- Head Pressure Transducer(s) - Factory Mounted
- Return Air Temperature - Factory Mounted
- Outdoor Air Temperature - Factory Mounted
- Exhaust Air Temperature - Factory Mounted

Select Standard Design Features

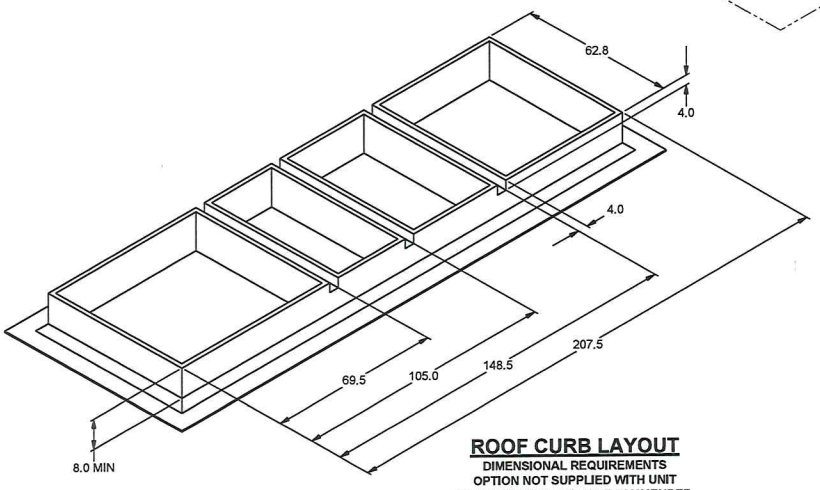
- ASHRAE 62 Complaint Stainless Steel Drain Pan
- Each unit factory tested per UL 1995 Requirements
- Intertek (ETL) UL STD 1995 Listed/Labeled
- Factory installed and tested controls


Supply Fan Curve (Each)
TSP (in w.g.)
0
1
2
3
4
5
6
7
8
0
500
1000
1500
2000
2500
3000
3500
4000
Airflow (CFM)


Exhaust Fan Curve (Each)
TSP (in w.g.)
0
1
2
3
4
5
6
0
1000
2000
3000
4000
5000
6000
Airflow (CFM)



UNIT AIR FLOWS AND CLEARANCES



ROOF CURB LAYOUT

DIMENSIONAL REQUIREMENTS
OPTION NOT SUPPLIED WITH UNIT
VIBRATION ISOLATION RECOMMENDED

ABOVEAIR TECHNOLOGIES
301-874-1130

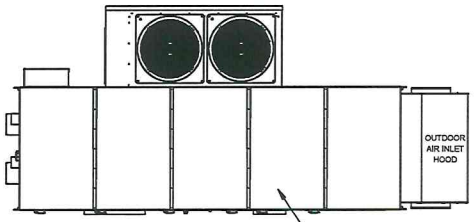
DWG NO.: MD6003-1-06
DATE: 08/02/19
REV: -

DESCRIPTION:

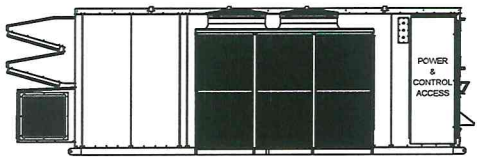
RT-OA ROOFTOP OUTDOOR AIR SERIES, D-CABINET W/ ERW, MODEL: RT-OAD-_-__-___, SIDE SUPPLY & RETURN

* DIMENSIONS/CONFIGURATIONS SUBJECT TO CHANGE

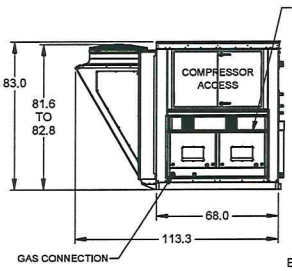
SHEET 1 OF 2



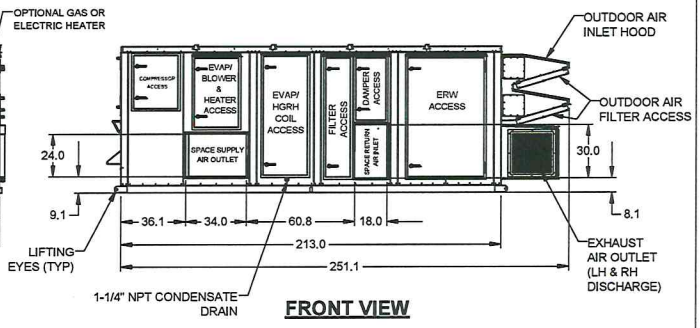
TOP VIEW



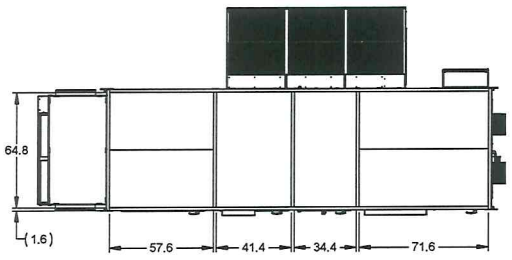
REAR VIEW



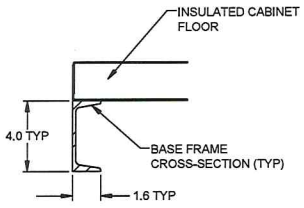
LEFT VIEW



FRONT VIEW



BOTTOM VIEW



BASE FRAME SECTION

ABOVEAIR TECHNOLOGIES
301-874-1130

DWG NO.: MD6003-1-06

DATE: 08/02/19

REV: -

DESCRIPTION:

RT-OA ROOFTOP OUTDOOR AIR SERIES, D-CABINET W/ ERW, MODEL: RT-OAD-_-__-___, SIDE SUPPLY & RETURN

*DIMENSIONS/CONFIGURATIONS SUBJECT TO CHANGE