



**ALTITUDE**

A Subsidiary of  
**MAFNA Air Technologies Inc.**



***We Make Labs Breathe Healthy***

# Company Profile



## Introduction:

We are pleased to introduce ourselves as MAFNA Air Technologies Inc., established in 1999. MAFNA Air Technologies Inc, is Canada's leading manufacturer and supplier of Air conditioning products. We offer expert solutions for all your cooling and heating needs. From schools to factories, we have catered to various schools to commercial applications in North America. We provide cost effective solutions for variety of energy saving needs.

We are dedicated to bringing you the finest in custom built **heat recovery units, rooftop units, air handling units, explosion proof units, Lab Exhaust, desiccant dehumidification unit, pool dehumidification unit, custom built fan coil units, fluid cooler unit, exhaust recovery unit, custom built pre-fabricated mechanical/boiler room, chilled beam units** and many more. Our motto is "We adapt our ENGINEERING to meet the requirements of your CUSTOM APPLICATIONS". We've been following this motto for the past 15 years.

Our energy efficient experts and engineers have made ground breaking innovations in this field.

Manufactured in our state of art facility, MAFNA produces sustainable products with full compliance to the specification. Mafna offers high quality construction units featuring fully welded structural bases and interior hemmed panels. Mafna offers fiberglass insulation, double wall construction in varying thicknesses and also a foam injected core construction featuring a unique tongue and groove construction for the ultimate in thermal break; it is lightweight and has a very durable casing.

# Overview

## Overview:

The ALTITUDE is intended for use in exhausting laboratory/hazardous fumes in a safe and efficient manner while simultaneously recovering energy .

The Altitude was developed for use in applications such as:

- Laboratories
- Pharmaceuticals
- Chemical & Petrochemical
- Waste Water
- Odor Control
- Hospitals
- Chemical Storage
- Hazardous Region



## Benefits:

### Prevent re-entrainment

ALTITUDE sends a vertical “jet plume” of diluted exhaust gas up to 350’ high, providing atmospheric disbursement and preventing exhaust from re-entering the facility through fresh air supply ventilation systems, doors, and windows.

### Eliminate odor

The ALTITUDE effectively eliminate odors, preventing them from entering the facility and neighboring buildings.



### Reduce noise

ALTITUDE is offers a number of noise attenuation accessories.

### Lower energy costs

Energy consumption is minimized with combination of Altitude and Energy Recovery System.

## Features :



- Heating and Cooling up to 80,000 cfm
- External static pressure up to 8 in. wg
- Induced flow windband
- Mixed flow wheel design
- High velocity plume dispersion nozzle
- Wheel diameters from 12.5" through 66"
- Direct Drive with VFD
- Spark Resistant option available
- Three discharge nozzles available per size
- 125 mph wind load capability



## Construction :

- Casing Construction : Stainless Steel, Aluminum, Steel, Thermal break Casing are available.
- Wall Thickness : 2 - 4 inch thick Double Wall Construction. Wall using injected foam construction. 2.0" fiberglass or PU Foam insulation.
- Base: 4,6,8 inches Formed Steel Channel.. Floor: 14 Ga. Epoxy coated.
- Filters : 2-4 inch MERV 8 Pleated Pre-filters. Optional Secondary Filters (MERV 11-15), Carbon available.
- Coils : Aluminum Fins with copper tubing in Galvanized Casing. Optional Copper Fins, Stainless steel Casing available.
- Drain Pans: 16 G Stainless Steel drain pans
- Access Doors/Panels for Fan sections : Aluminum frame with continuous SS piano hinge with view port and test ports.
- Roof Curb: Optional 16" Heavy-duty coated steel curb available.
- Warranty: The product is warranted against manufacturing defects for 1 year from the date of manufacturing.

## ALTITUDE with Energy Recovery System:



The conditioned air exiting the laboratory contains energy that's going to waste. You can reduce your cooling costs by capturing energy and recycling it. The exhaust air extracts the heat from the medium(water or a water/anti-freeze mix) via heat exchanger and the cold water is transferred to a heat exchanger located in a hot stream of incoming outside air. A pump keeps the system circulating.

Because the unit is sealed, it can transfer heat energy from contaminated exhaust air to incoming fresh air without degrading the quality of the incoming air.

The exhaust fan induces clean, external air and mixes it with the contaminated building exhaust to dilute the air and increase the outlet volume, exhausting the air at a high velocity to prevent the fumes from re-entering the buildings intake or make-up air.



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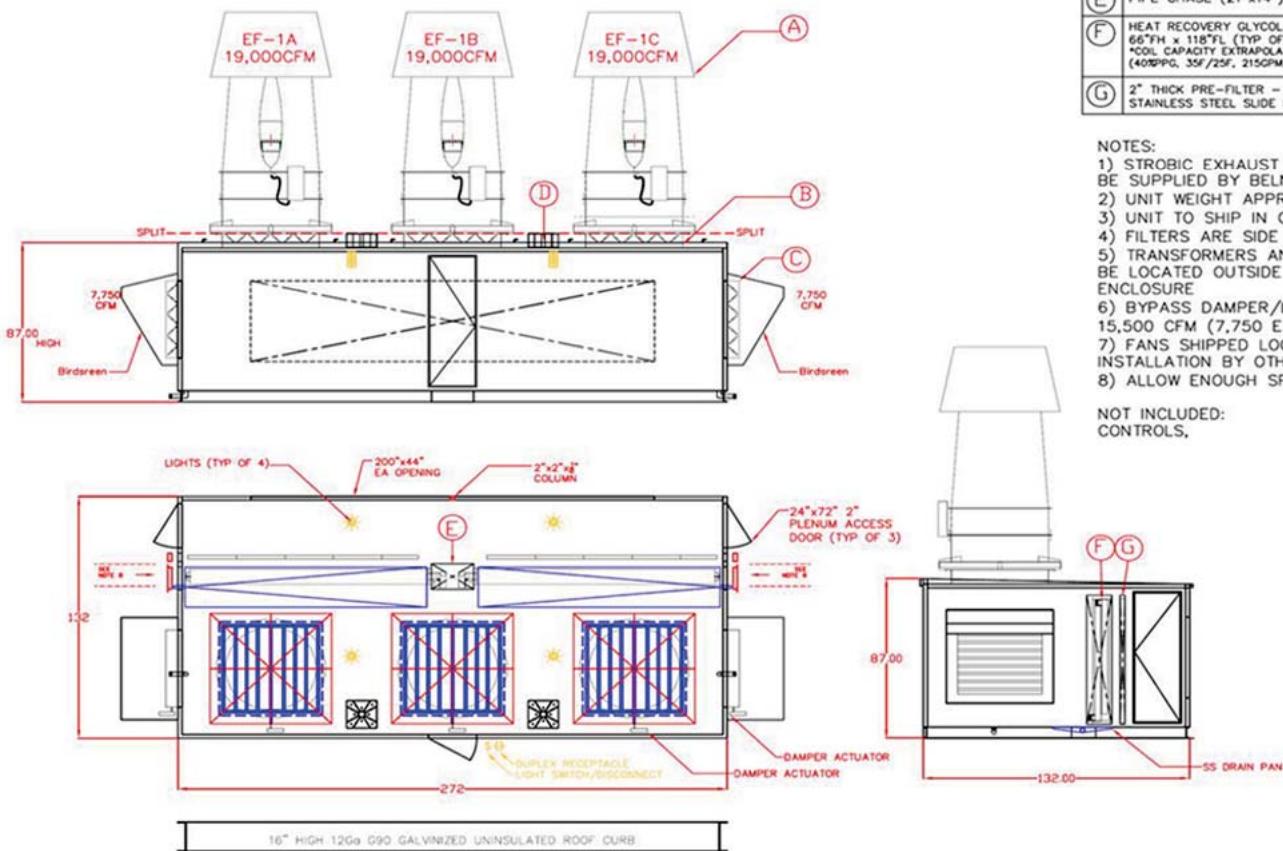
**PROJECT:** 57,000 CFM Fume Exhaust Heat Recovery Unit  
**CLIENT:** York University- Life Sciences Bldg, Toronto, ON  
**REP:** Belnor Engineering, Toronto,



OUTER CASING	16 Gauge Solid Satin Coat Galvanneal Steel Painted Grey	BASE PERIMETER	Structural Steel Channel epoxy primed and coated C6 @ 8.2	WALL PANEL	2" THICK, 3.5lb/cft Mineral Wool Insulation
INNER Casing	20 Gauge 304 Stainless Steel	UNDERSIDE FLOOR	20 Gauge Solid G90 Galvanized Steel (4" Thick Insulation)	FLOOR PLATE	14Ga 304 Stainless Steel welded to base

- (A) STROBIC LAB EXHAUST FANS - 3 @ 57,000 CFM (19,000 CFM EACH)
- (B) EPOXY COATED FAN ISOLATION DAMPER (OPPOSED BLADE) - 48'L x 48'H (TYP OF 3)
- (C) BYPASS DAMPER (OPPOSED BLADE) & RAINHOOD WITH SCREEN - 42'L x 42'H (TYP OF 2) 9,500CFM EACH
- (D) JIB CRANE SOCKET (TYP OF 2)
- (E) PIPE CHASE (21"x14")
- (F) HEAT RECOVERY GLYCOL COIL WITH ELECTROFIN COATING - 66"FH x 118'FL (TYP OF 2)  
COIL CAPACITY EXTRAPOLATED WITHIN 3% BASED ON HRC-4 OF AHU-44 (405PPC, 35F/25F, 2150PM, SAT 75%/56F)
- (G) 2" THICK PRE-FILTER - MERV 7 (30% EFF) LOADED IN STAINLESS STEEL SLIDE RACK: 20x24(QTY 10) 24x24(QTY 20)

## DETAIL DRAWING

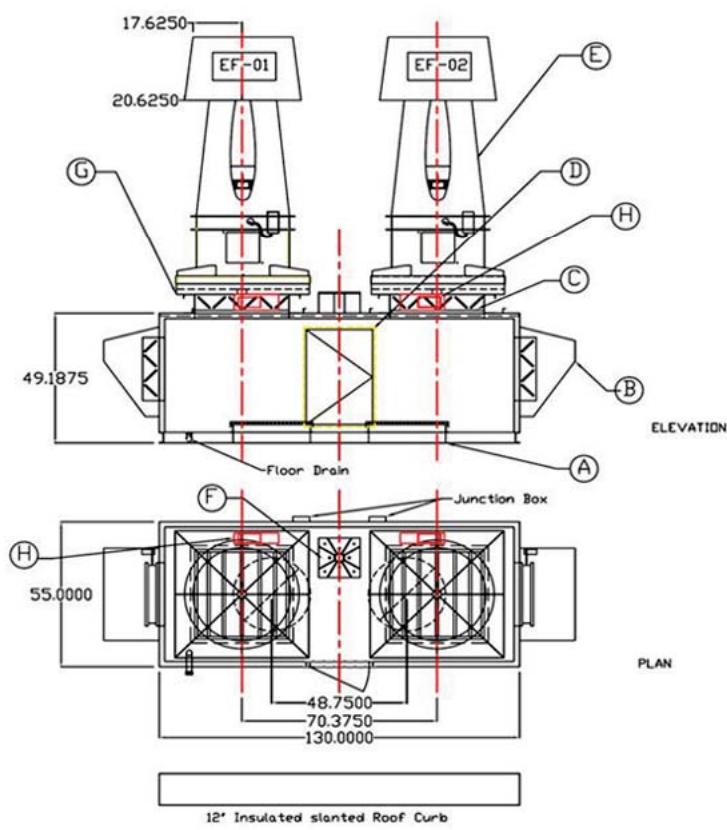


- NOTES:
- 1) STROBIC EXHAUST FAN WITH ACCESSORIES TO BE SUPPLIED BY BELNOR ENGINEERING
  - 2) UNIT WEIGHT APPROXIMATELY 15,000 LB
  - 3) UNIT TO SHIP IN ONE (1) SECTION
  - 4) FILTERS ARE SIDE LOADING
  - 5) TRANSFORMERS AND DAMPER ACTUATORS TO BE LOCATED OUTSIDE IN A WEATHERPROOF ENCLOSURE
  - 6) BYPASS DAMPER/LOUVER SIZED TO BYPASS 15,500 CFM (7,750 EACH).
  - 7) FANS SHIPPED LOOSED FOR FIELD INSTALLATION BY OTHERS.
  - 8) ALLOW ENOUGH SPACE FOR COIL REMOVAL

NOT INCLUDED:  
CONTROLS,

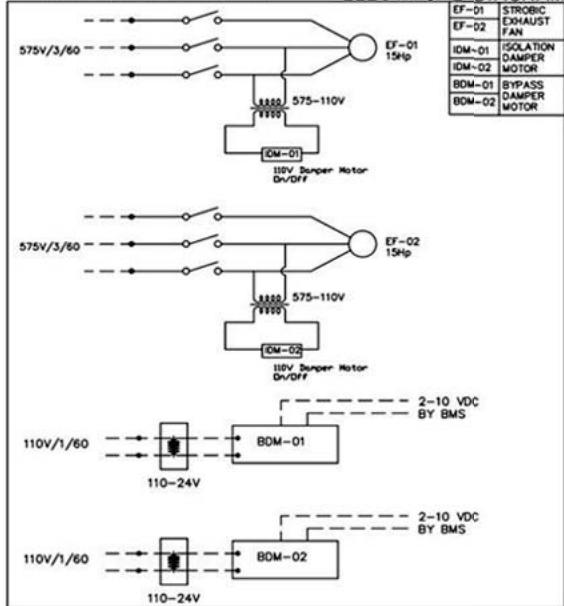


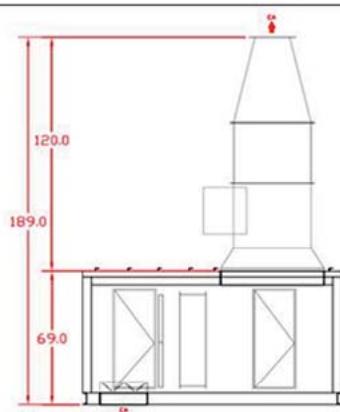
OUTER CASING	16 Gauge Solid Satin Coat Galvanneal Steel Painted	BASE PERIMETER	Structural Steel Channel epoxy primed and coated C4"-5.4	WALL PANEL	2" THICK, 3.5lb/cft Mineral Wool Insulation
INNER CASING	20 Gauge 304 Stainless Steel	UNDERSIDE FLOOR	22 Gauge Solid G90 Galvanized Steel (3" Thick Insulation)	FLOOR PLATE	16 Gauge 304 Stainless Steel fully welded and screwed to cross members



Notes:  
1) STROBIC EXHAUST FAN WITH ACCESSORIES TO BE SUPPLIED BY BELNOR ENGINEERING  
2) ROOF CURB TO BE SUPPLIED AND INSTALLED IN THE FIELD BY MECHANICAL CONTRACTOR  
3) TRANSFORMERS TO BE LOCATED INSIDE THE UNIT WIRED TO JUNCTION BOX  
NOT INCLUDED:  
1) LIGHTS, RECEPTACLES, SWITCHES

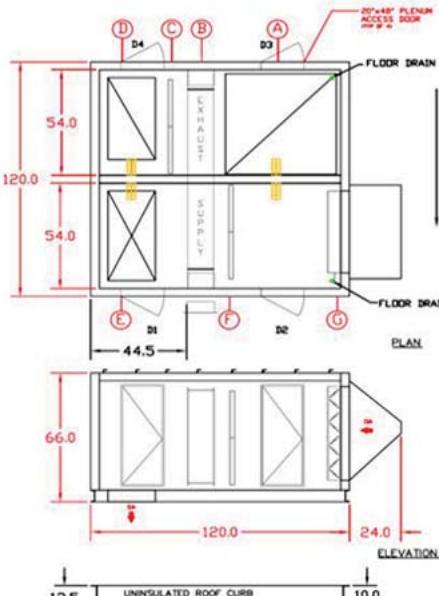
ELECTRICAL DIAGRAM



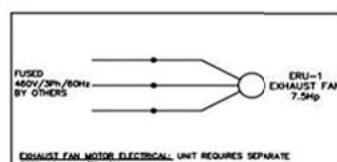
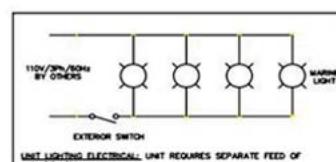

**Submittal Drawing**
**ERU-1**

OUTER CASING	16 Gauge Solid Satin Coat Galvanneal Steel Painted GREY
INNER CASING	22 Gauge G90 Solid Galvanized steel.
BASE PERIMETER	Structural Steel Channel epoxy primed and coated C6™ 8.2
UNDERSIDE FLOOR	22 Gauge G90 Galvanized Solid Sheet (4" Thick Insulation)
WALL PANEL	4" THICK, 3.5lb/cft Mineral Wool Insulation
FLOOR PLATE	14 Gauge G90 Galvanized Solid Steel

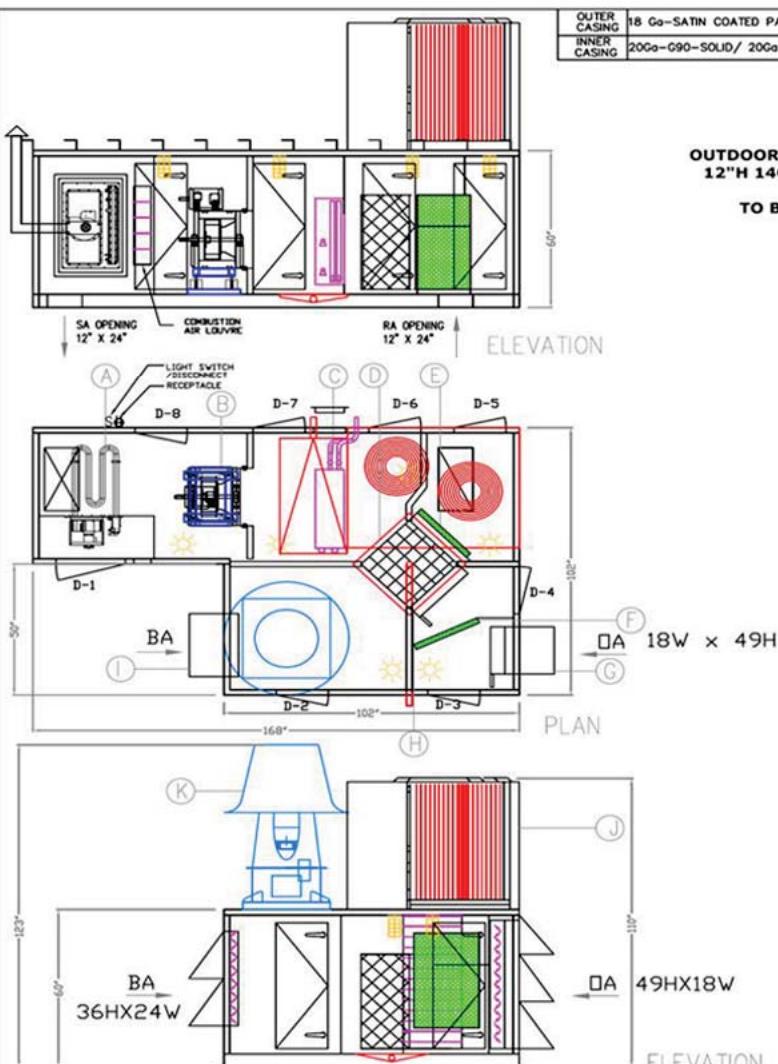
- |     |  |
|-----|--|
| (A) | LAB EXHAUST TUBULAR CENTRIFUGAL INLINE UBLAST FAN, TONHBLE, 7000 CFM @ 2.5" w.g TSP, 7.5HP |
| (B) | 6 ROW ENERGY RECOVERY HEAT PIPE: 46.75"FH x 92"FL  |
| (C) | 2" DEEP 30% EFF MERV 7 PRE FILTER (EXHAUST AIR)  |
| (D) | 22"x42" EA INLET DAMPER  |
| (E) | 22"x46" SA DISCHARGE   |
| (F) | 2" DEEP 30% EFF MERV 7 PRE FILTER (SUPPLY AIR)   |
| (G) | 42"x48" OA DAMPER WITH RAINHOOD  |


**NOTES:**

- 1) UNIT TO BE SHIPPED IN ONE (1) SECTION.
- 2) ESTIMATED UNIT WEIGHT IS 6,000 LB.
- 3) UNIT CONSTRUCTED PER MAFNA STANDARD OUTDOOR CONSTRUCTION WITH SLOPED ROOF AND RAISED SEAMS
- 5) LAB EXHAUST FAN TO BE FREE-ISSUED TO MAFNA FOR INSTALLATION AND TESTING, THEN SHIPPED LOOSE FOR FIELD INSTALLATION BY OTHERS
- 6) ROOF CURB TO BE SHIPPED LOOSE ALONG WITH UNIT FOR FIELD ASSEMBLY AND INSTALLATION BY OTHERS.

**NOT INCLUDED:**  
- CONTROLS,


- OPENING LIST
1. EA OPENING, 42"x22"
  2. SA OPENING, 46"x22"
  3. FAN OPENING, 45.5"x43.5"
  4. DA OPENING, 42"x48"
  5. HEAT PIPE REMOVABLE OPENING: 13"x51.5"
  7. DODR1 OPENING: 20"x52" -Ve LH
  8. DODR2 OPENING: 20"x52" -Ve RH
  9. DODR3 OPENING: 20"x52" -Ve RH
  10. DODR4 OPENING: 20"x52" -Ve RH



OUTER CASING	18 Ga-SATIN COATED PAINTED	BASE	C5 - STRUCTURAL CHANNEL	WALL& ROOF	2" THICK-3.5 LBS/CUFT, MINERAL WOOL INSUL.
INNER CASING	20Ga-G90-SOLID/ 20Ga SS304 EXHAUST AREA	UNDERSIDE FLOOR	20 GA G90 SOLID 4" THICK-3/4 LBS/CUFT FIBREGLASS INSUL.	FLOOR	16Ga- G90 SOLID/ 14 Ga 304SS EXHAUST AREA
<hr/>					
(A)	INDIRECT GAS FIRED HEATER, HEATCO HMG 250MBH.				
(B)	SUPPLY FAN: TWIN CITY EPF 150, ARR3, CLASS 2, BELT DRIVE, SHM ODP PREMIUM EFF. MOTOR 575V/3PH/60.				
(C)	DX COOLING COIL, 6-ROW 9FPI, 30"FH X 27"FL				
(D)	PLATE HEAT EXCHANGER, XETEX XLT-S24(24)-36				
(E)	2"30% RETURN AIR FILTER IN SS HOLDING FRAME. 1# 24"X24", 1# 24"X12"				
(F)	2"30% FILTER IN GALV HOLDING FRAME. 1# 24"X24", 1# 24"X12"				
(G)	OA DAMPER & LOUVRE.				
(H)	FACE & BYPASS OA DAMPER.				
(I)	BA DAMPER & LOUVRE.				
(J)	CONDENSING UNIT, CARRIER 3BAUD014 12.5 TON				
(K)	EXHAUST FAN, STROBIC BS002 TRI STACK 2500CFM				

**DRAWING**  
**OUTDOOR CURB ROOF MOUNTED UNIT**  
**12"H 14GA G90 INSULATED KNOCK**  
**DOWN CURB**  
**TO BE SUPPLIED BY MAFNA**

**DRAWING NOTES:**

- 1) ALL SECTIONAL DIMENSIONS ARE PRELIMINARY AND WILL BE CONFIRMED ONCE MANUFACTURING DRAWINGS ARE COMPLETED
- 2) THE UNIT WILL BE CONSTRUCTED TO HOLD OVERALL UNIT OUTER LENGTH, WIDTH AND HEIGHT DIMENSION WITHIN A TOLERANCE OF 1/2"(APPROX 12.5mm). ALL THE OTHER DIMENSION ARE FOR INFORMATION PURPOSE ONLY AND MAY CHANGE BASED ON CONSTRUCTION REQUIREMENT.
- 3) ALL VIBRATION ISOLATORS TO HAVE 1" (25.4mm) DEFLECTION.
- 4) 1# 575V/3PH/60HZ REQUIRED.  
1# 120V/1PH/60 REQUIRED.
- 5) ESTIMATED UNIT WEIGHT 5,900 LBS.
- 6) UNIT TO SHIP IN ONE SECTION.

<b>DOOR OPENING:</b>
1. DOOR-1 : 24"x48" N/R
2. DOOR-2 : 18"x48" N/L
3. DOOR-3 : 18"x48" N/L
4. DOOR-4 : 18"x48" N/L
5. DOOR-5 : 18"x48" N/R
6. DOOR-1 : 18"x48" N/R
7. DOOR-2 : 18"x48" N/R
8. DOOR-3 : 18"x48" P/R

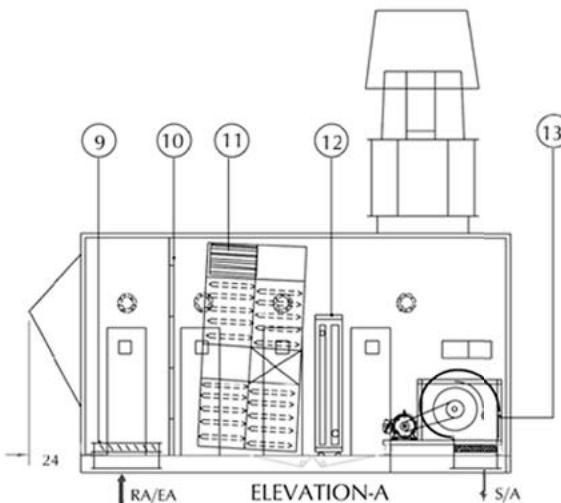
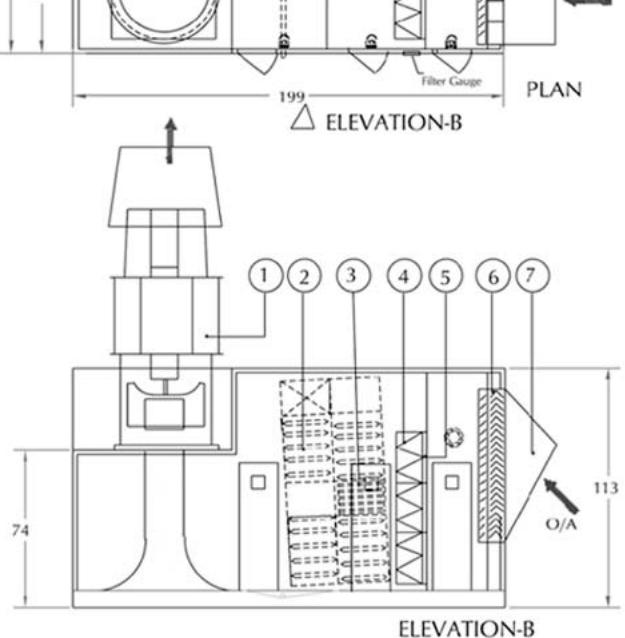


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**PROJECT:** 10,000 CFM Fume Exhaust Heat Recovery Unit  
**CLIENT:** Clarkson University- Speed Lab, Postdam, NY  
**REP:** RL Kistler, Syracuse, NY



Outer Casing	18G G90 solid Painted	Base	C8 x 11.5-6' Channel Epoxy Painted	Panel	2" Thick, 3.0 lbs/ft <sup>3</sup> Insulation	(1)	10,000 CFM Strobic Fan @2.2" WG TSP
Inner Casing	18G Perf G90 in Fan Section, Solid in Other Sections	Underside Floor	20G G90 Solid Satin Coated	Floor	14G Checkered Plate	(2)	Air-To-Air Heat Exchanger NV 85/L201



**As Built Drawing**

10,000 CFM @5.5" TSP



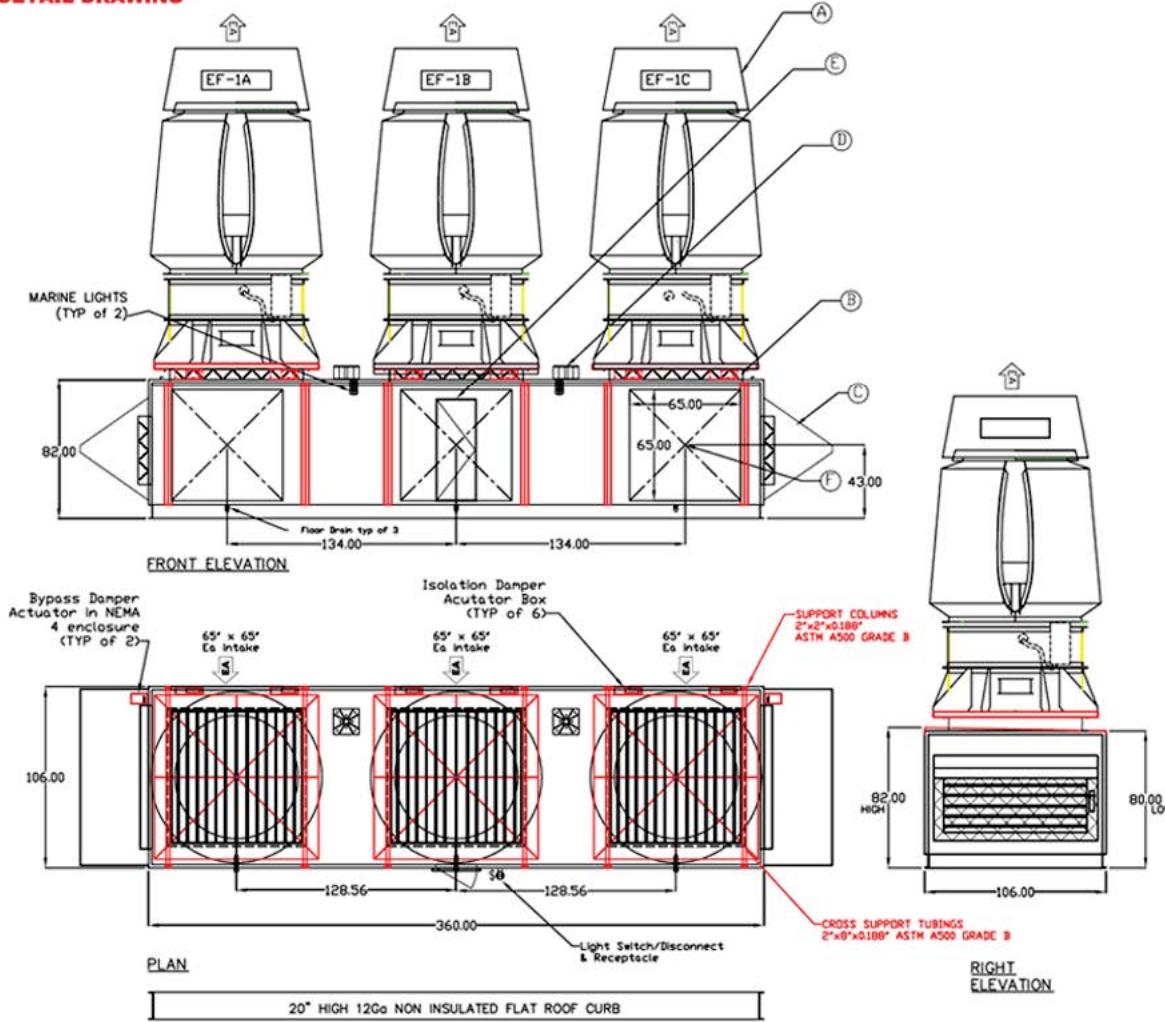
**ALTITUDE**  
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**PROJECT:** 139,500 CFM Fume Exhaust Heat Recovery Unit  
**CLIENT:** Brock University-NHBSRC, St. Catherines, ON  
**REP:** Belnor Engineering., Vaughan, ON



OUTER CASING	16 Gauge Solid Satin Coat Galvanized Steel Painted Grey	BASE PERIMETER	Structural Steel Channel epoxy primed and coated C8 @ 11.5	WALL PANEL	2" THICK, 3.5lb/cft Mineral Wool Insulation
INNER CASING	20 Gauge 304 Stainless Steel	UNDERSIDE FLOOR	20 Gauge Solid G90 Galvanized Steel (4" Thick Insulation)	FLOOR PLATE	14Ga 304 Stainless Steel welded to base

#### DETAIL DRAWING



- (A) STROBIC LAB EXHAUST FANS – 3 @ 139,500 CFM (46,500 CFM EACH) WITH NOZZLE SILENCERS, 8,490 LB EACH
- (B) GREENHECK VCD-43 EPOXY COATED FAN ISOLATION DAMPER (OPPOSED BLADE) – 78'L x 78'H (TYP OF 3)
- (C) TAMCO 9000 BYPASS DAMPER (OPPOSED BLADE) & RAINHOOD WITH SCREEN – 84"W x 40"H (TYP OF 2) 23,250CFM EACH
- (D) JIB CRANE SOCKET (TYP OF 2)
- (E) 2" THICK PLENUM ACCESS DOOR WITH CONTINUOUS HINGE N/L 24"Wx60"Hx2", WITH 1.5" RAIN GUTTER
- (F) SIDE EXHAUST AIR OPENINGS: 3# 65"W x 65"H

#### NOTES:

- 1) STROBIC EXHAUST FAN WITH ACCESSORIES TO BE SUPPLIED BY BELNOR ENGINEERING
- 2) UNIT TO BE CONSTRUCTED PER MAFNA STANDARD OUTDOOR CONSTRUCTION WITH SLOPED ROOF AND RAISED SEAMS.
- 3) UNIT WEIGHT APPROXIMATELY 38,060 LB
- 4) UNIT TO SHIP IN ONE (1) SECTION
- 5) TRANSFORMERS AND DAMPER ACTUATORS TO BE LOCATED OUTSIDE IN A WEATHERPROOF ENCLOSURE
- 6) BYPASS DAMPER/LOUVER SIZED TO BYPASS 46,500 CFM (23,250 EACH).
- 7) FANS SHIPPED LOOSE FOR FIELD INSTALLATION BY OTHERS.
- 8) FLOOR DRAIN WELDED TO BASE

NOT INCLUDED:  
CONTROLS,

SUPPORT COLUMN:  
2"x2"x0.188"-ASTM A500 GRADE B  
CROSS SUPPORT TUBINGS:  
2"x0"x0.188"-ASTM A500 GRADE B  
LIFTING LUGS EXCLUDE THE THREE FAN SYSTEM'S LOAD

BETWEEN THE STRUCTURE PARTS, ROOF SHOULD BE GOOD WELDING.



**ALTITUDE**

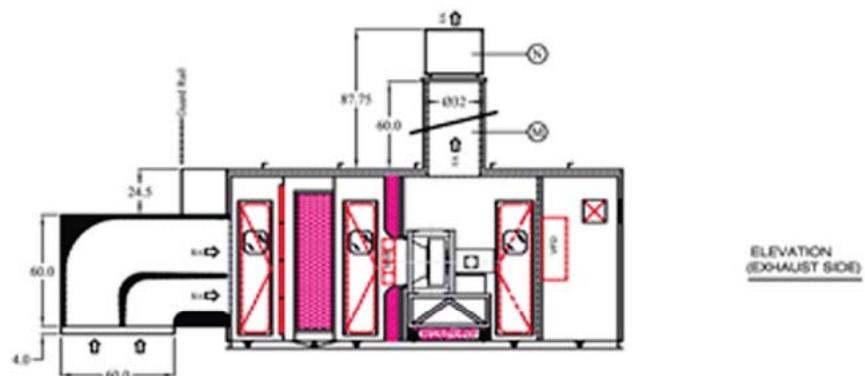
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PROJECT:  
CLIENT:  
REP:

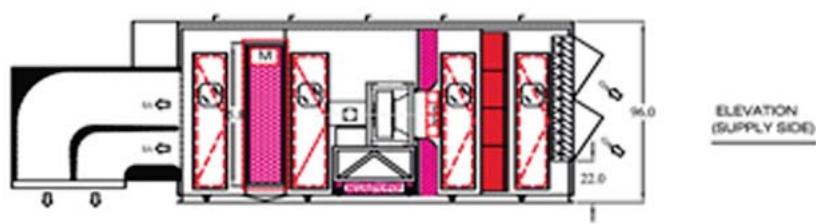
7,000-12,000 CFM Lab Exhaust Make Up Air Units  
Syracuse University- Baker Lab, Syracuse, NY  
RL Kistler, Syracuse, NY



OUTER CASING	18G SOLID SATIN COAT - PAINTED	BASE	C4 X 5.4 CHANNEL - EPOXY PAINTED	PANEL	2" THICK, 3.0 lbs/in <sup>2</sup> INSULATION
INNER CASING	20G SOLID ALUMINUM (PERF. IN FAN SECTION)	UNDERSIDE FLOOR	20G SOLID GALVANIZED	FLOOR	14G ALUMINUM CHECKER PLATE



- (A) Acoustical Elbow
- (B) SEMCO TE3-13 Heat Wheel, 75.6" Wx75.6" Hx21" D
- (C) Twincity Direct Drive Plenum Supply Fan/Motor/Inertia Base
- (D) Acoustical Flow Inlet
- (E) Farr 2" 30/30 PreFilter(30%): 20x20(7")+20x24(1") /Farr 12" Riga-Flo Second Filter(95%): 20x20(7")+20x24(1")
- (F) OA Weatherhood/Louver ESD-603/Damper VCD-43
- (G) Strip Heater
- (H) Vestibule Louver ESD-202
- (I) Vestibule Louver ESD-202
- (J) Twincity Direct Drive Plenum Return Fan/Motor/Inertia Base
- (K) Farr 2" 30/30 Pre-Filter(30%) - 20"x20"(8")
- (L) Duct Cover/Shroud (Shipped Loose)
- (M) #32 Aluminum Exhaust Duct(2" Double Wall/Perforated Inner Skin) - Shipped Loose
- (N) Greenheck Non-Powered Upblast Ventilator



UNIT NO. ERU -	5	6	7	8	9
SUPPLY (CFM)	9900	10500	7300	7300	39900
RETURN (CFM)	9000	9400	5700	7140	8750

Note: 1. Unit Mounted on Roof Structural Steel (No Curb)  
2. Access on both sides  
3. Power Supply for Fan Is 460/3/60, for Light Is 120/1/60  
4. Estimated Weight Is 9,000 Lbs  
5. Estimated LWA@25' From Unit: 69dBA  
6. Ref Dwg. H-1.17 and H-2.6

Legend:

- Incandescent Lighting Fixture
- Magnetic Gage
- Lighting Switch
- Removable Panel



... In Every Environment

## MAFNA Air Technologies Inc

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### Mafna customers include:

American Airlines  
Bay Regional Medical Center  
Bell Canada  
Bombardier  
Brock University  
Cape Cod Hospital  
City of New York  
City of Toronto  
Clarkson University  
Cornell University  
Corning Inc  
DeBeers Diamond Inc.  
Dow Chemical  
ENI Petroleum  
Georgia State University  
Glaxo Smith Kline  
GO Transit  
Gold's Gym  
Hamilton Health Sciences Center  
Lakehead University  
Memorial Sloan-Kettering Cancer Center  
New York Methodist Hospital  
Peel District School Board  
Queens University  
Royal Bank of Canada  
Sofina Foods  
State of Alaska  
State of Massachusetts  
State University of New York  
Sunnybrook Hospital  
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York University