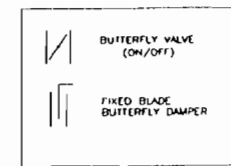
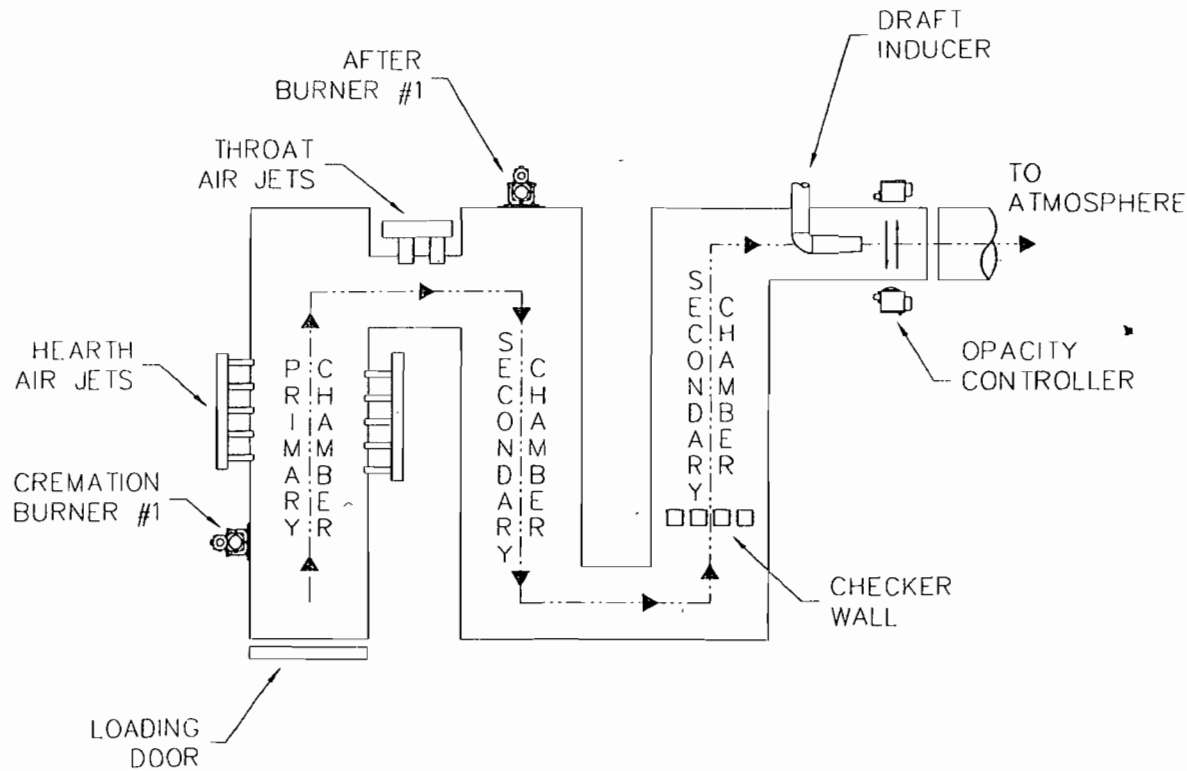


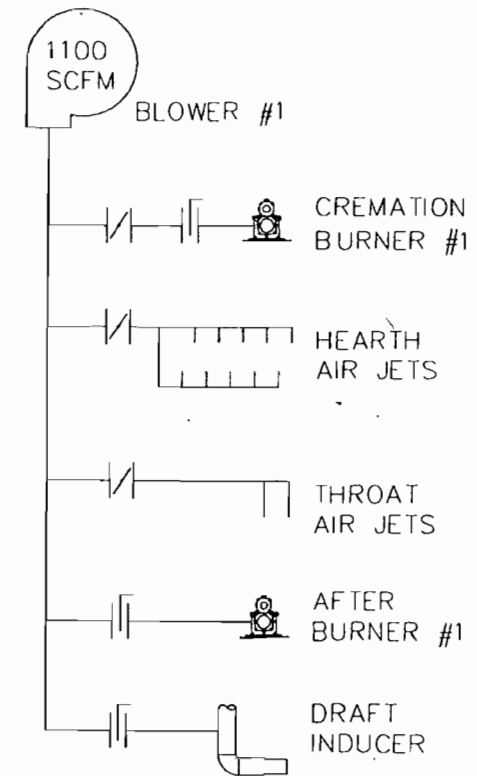
LEGEND OF SYMBOLS



FLOW DIAGRAM



AIR SCHEMATIC



*Strunk*

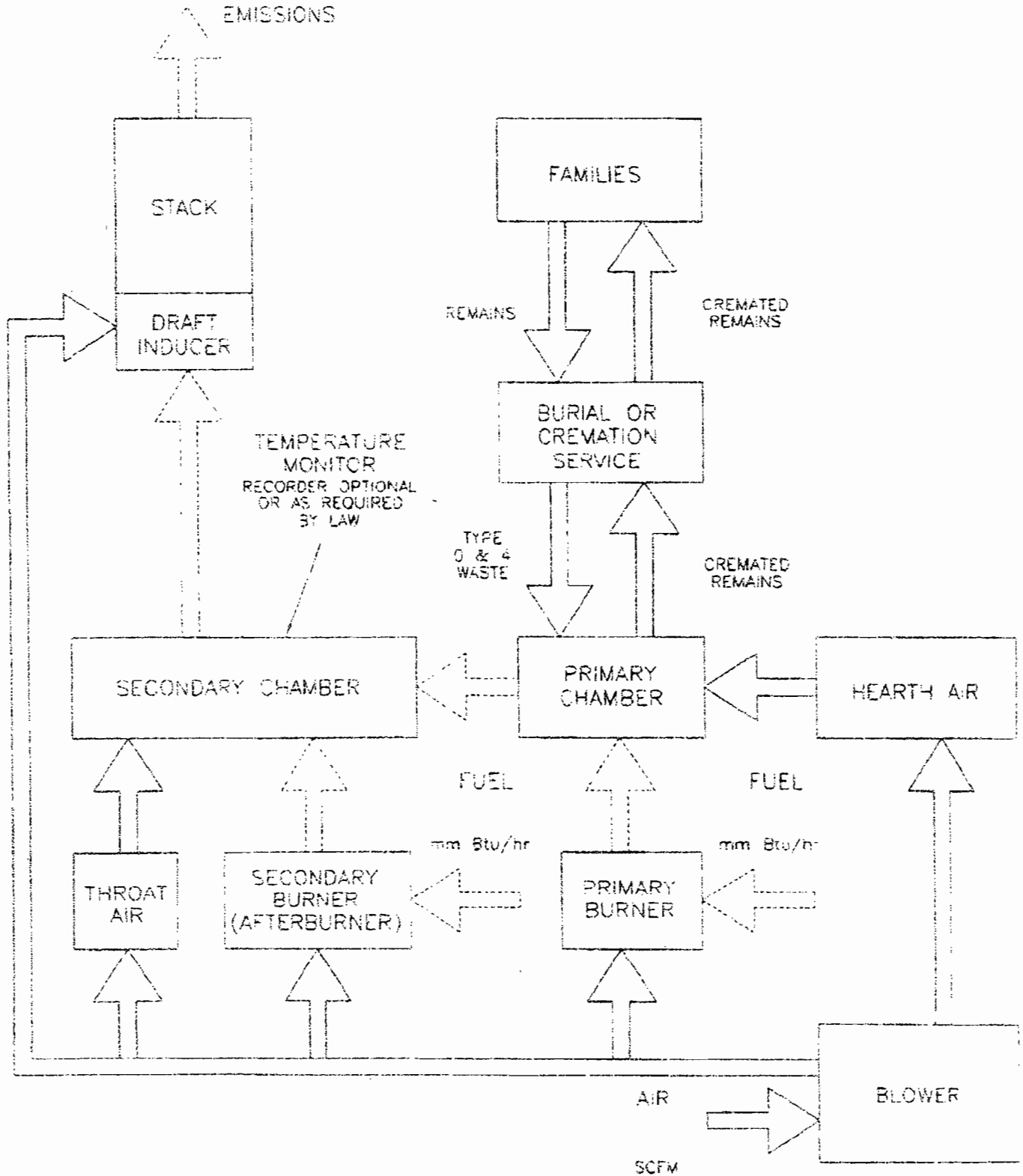
2045 Sprint Boulevard  
Apopka, Florida 32703  
USA

SUPER POWER PAK III

FLOW DIAGRAM  
& AIR SCHEMATIC

DATE:	08-05-05	SCALE:	1/4"=1'
DRAWN:	JG	PLOT SCALE:	1:48
APRVD:		SHEET:	1 OF: 1
DWG FILE:	SPPIIIFlowDiaAirSchem		
DWG #:	0000523		

# PROCESS FLOW DIAGRAM CREMATOR

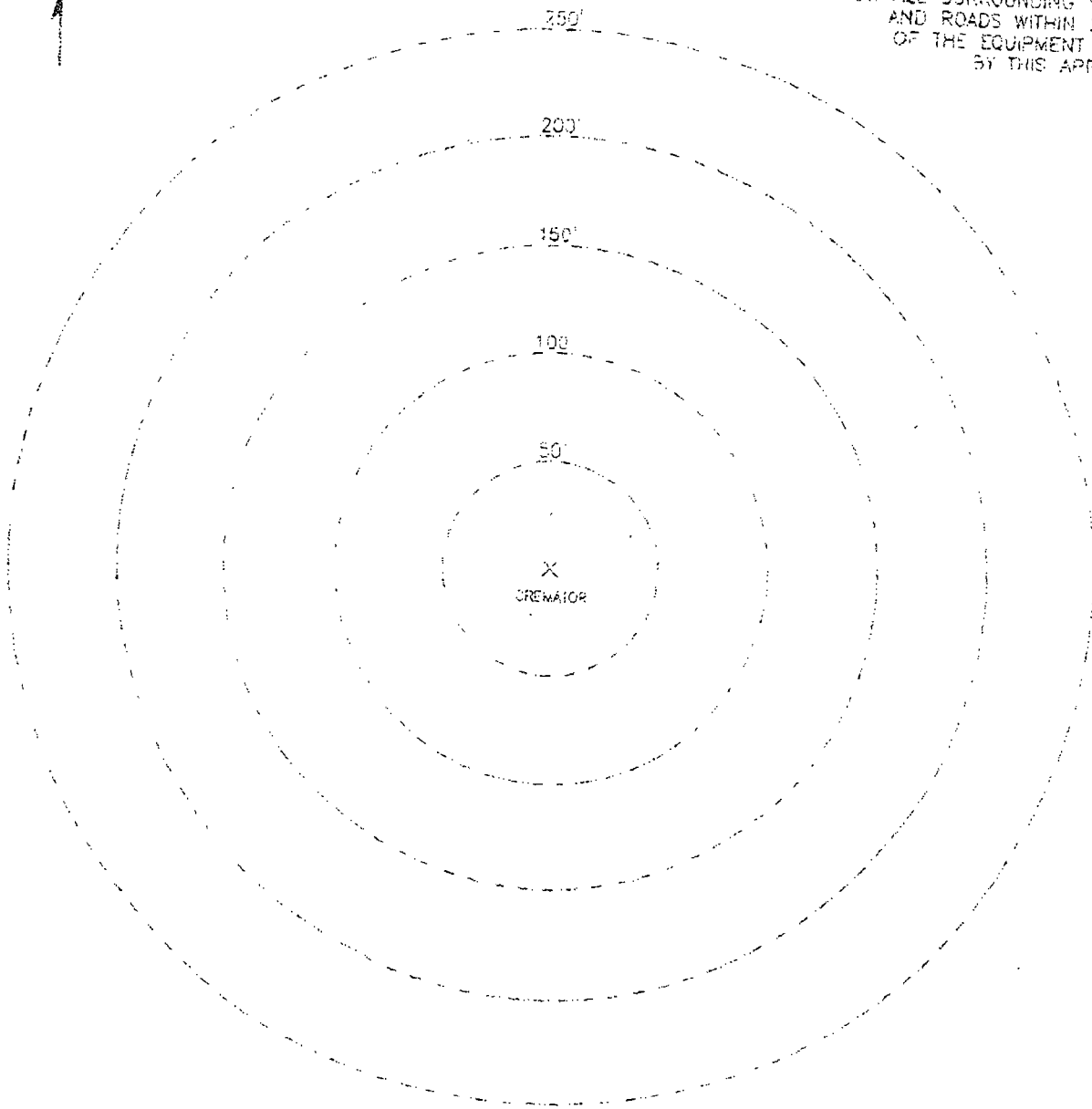


# PLOT PLAN

NORTH



SHOW ALL SURROUNDING BUILDINGS AND ROADS WITHIN 250 FEET OF THE EQUIPMENT COVERED BY THIS APPLICATION.

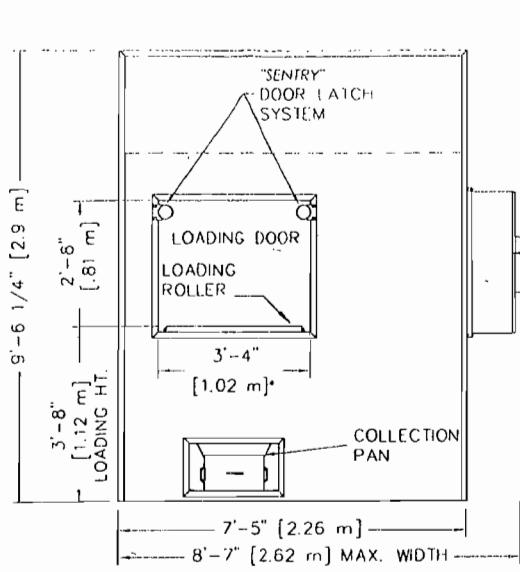


<u>STRUCTURE</u>	<u>DESCRIPTION</u>
------------------	--------------------

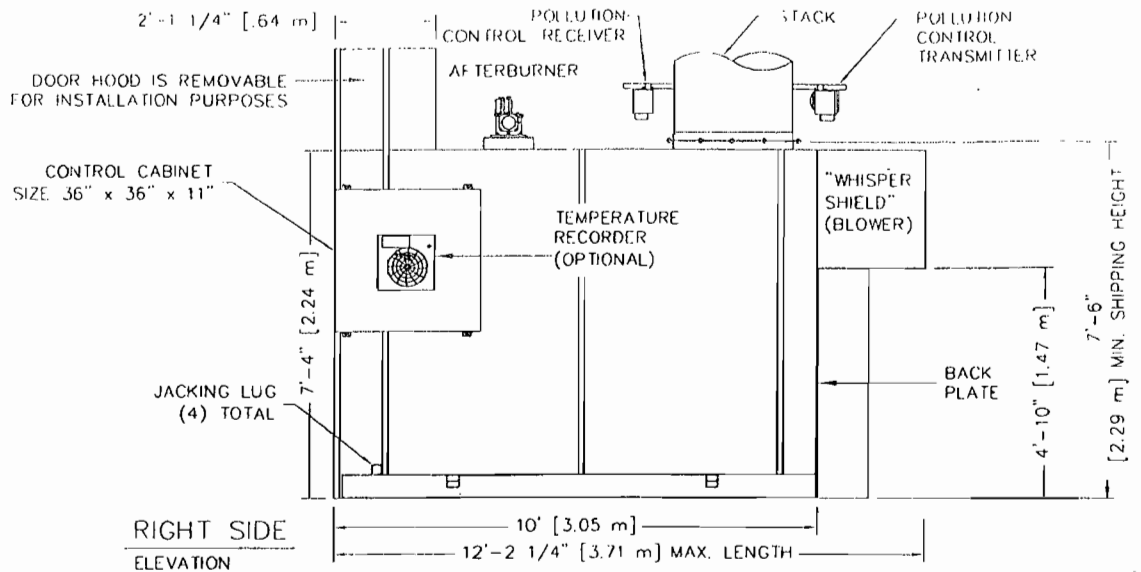
INSTRUCTIONS

1. INDICATE LOCATION AND TYPE OF BUILDING BY THE USE OF SMALL NUMBERED CIRCLES WITH THE DESCRIPTION BELOW.
2. SHOW ROADS AS LINES REPRESENTING THE ROAD EDGES. INDICATE STREET NAMES AND HIGHWAY NUMBERS
3. SHOW WOODED OR CLEARED AREA BY APPROXIMATE BOUNDARY LINES AND THE WORDS "WOODS," "CLEARED," "CORNFIELD," ETC

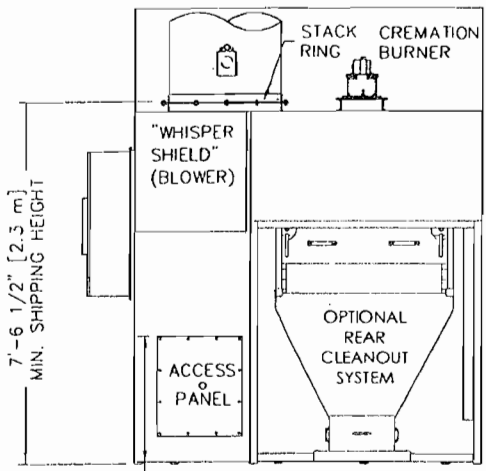
- (1)
- (2)
- (3)
- (4)
- (5)
- (6)
- (7)
- (8)
- (9)
- (10)



FRONT  
ELEVATION



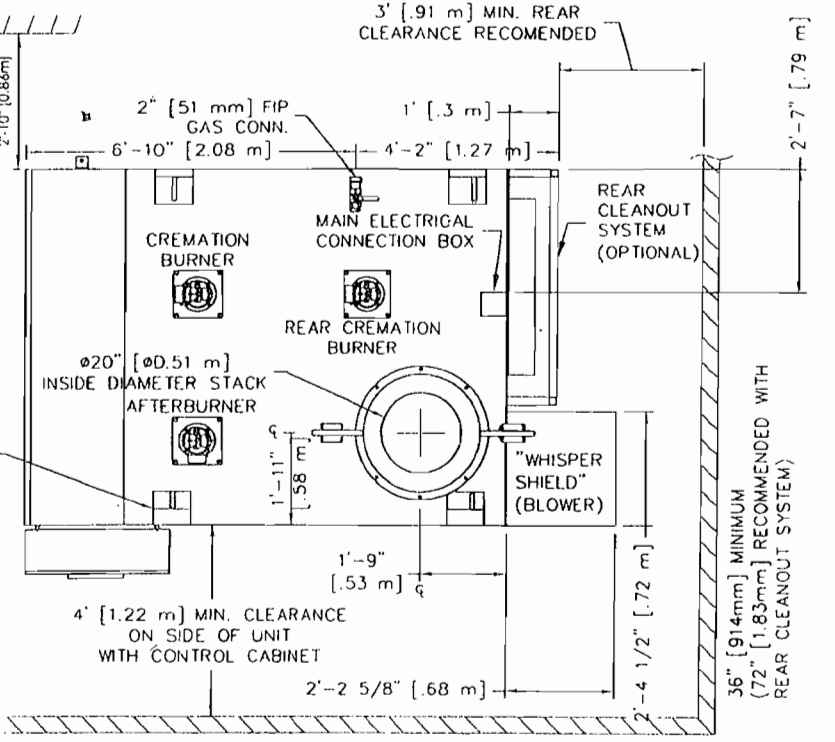
RIGHT SIDE  
ELEVATION



REAR  
ELEVATION

IF EQUIPPED WITH PREHEAT BURNER, 34" [0.81m] MINIMUM CLEARANCE IS REQUIRED ON THE SIDE OF UNIT OPPOSITE THE SIDE WITH THE CONTROL CABINET (RIGHT OR LEFT SIDE).

- NOTES:
- 1) CONTROL CABINET MOUNTS ON UNIT'S LEFT OR RIGHT SIDES, OR REMOTELY.
  - 2) CHAMBER WIDTH IS 39" [0.99m].



PLAN  
VIEW

**Matthews**  
CREMATION DIVISION

2045 Sprint Boulevard  
Apopka, Florida 32703  
USA

SUPER POWER-PAK III

PLAN & ELEVATIONS INCL: CLEARANCES,  
REQUIREMENTS & RECOMENDATIONS

DATE:	10-26-06	SCALE:	1/4"=1'
DRAWN:	JG	PLOT SCALE:	1:48
APRVD:		SHEET:	1 OF: 2
DWG FILE:	SPPIII-MarketingPlanElevR2		
DWG #:	0000196		

## CREMATOR CLEARANCES

### RECOMMENDED

### MINIMUM

TOP: ②	2 FEET [610 mm]	6 INCHES [152 mm]
CABINET SIDE:	4 FEET [1.22 m]	4 FEET [1.22 m]
OTHER SIDE:	2 FEET [610 mm]	6 INCHES [152 mm]
FRONT:	9 FEET [2.74 m]	8 FEET [2.44 m]
REAR:	3 FEET [0.91 m]	32 INCHES [812 mm]
STACK:	6 INCHES [152 mm]	6 INCHES [152 mm]

1. FOR CLEARANCES OTHER THAN THOSE SHOWN, OR FOR SPECIAL REQUIREMENTS, CONSULT YOUR MCD REP.

② FROM HIGHEST POINT ON UNIT

3. CONTROL CABINET MOUNTS ON UNIT'S LEFT OR RIGHT SIDES, OR REMOTELY. (SEE PLAN VIEW, SHEET 1).

4. REAR OF UNIT REFERS TO THE "BACK PLATE", RATHER THAN THE BACK OF THE "WHISPER SHIELD" (SEE PLAN VIEW, SHEET 1).

## CREMATOR REQUIREMENTS

FUEL: A PRESSURE REGULATOR ADJUSTABLE TO 7" [178 mm] W.C. FOR NATURAL GAS, OR 11" [279 mm] W.C. FOR LP GAS.

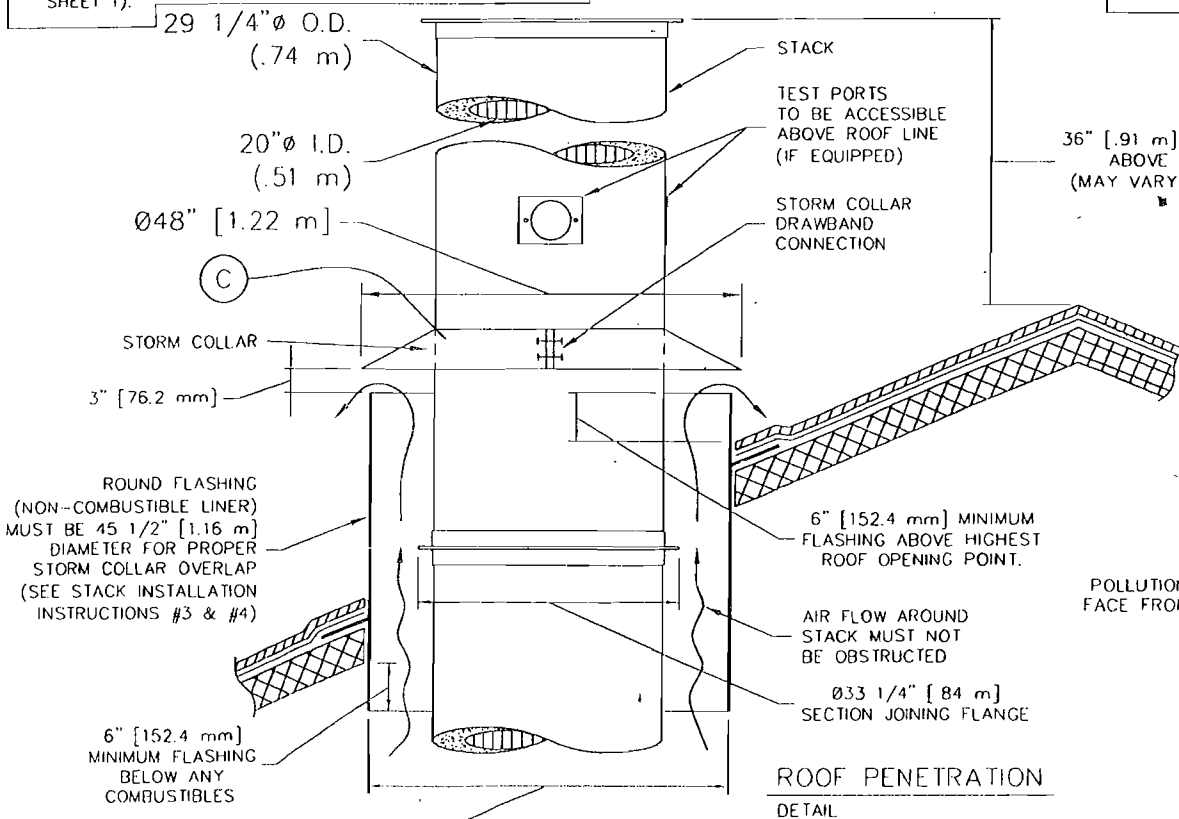
CAPACITY: RANGES FROM 2.0 TO 3.0 MILLION BTU/HR [2.1 TO 3.1 MILLION KILOJouLES/HR] DEPENDING UPON AMOUNT OF BURNERS.

ELECTRICAL: 230 VOLT, 3 $\phi$ , (40A BREAKER) AND 115v (10A BREAKER), OR 230 VOLT, 1 $\phi$ , (70A BREAKER) AND 115v (10A BREAKER) 50/60 HERTZ

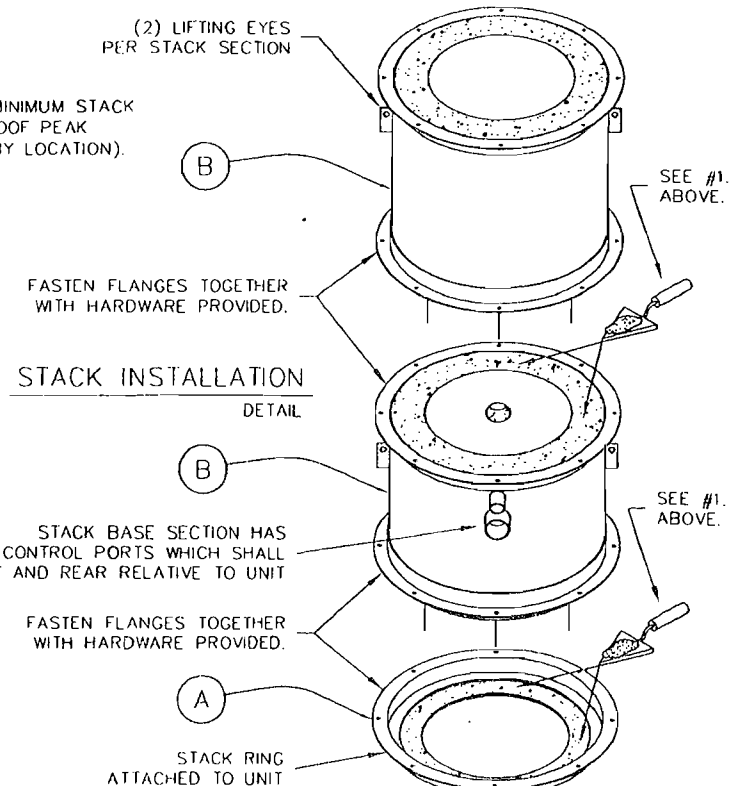
AIR LOUVER NEAR THE REAR OF THE UNIT CAPABLE OF PASSING 2,500 CU FT/MIN [70.8 CU M/MIN] OF FREE AIR (36" X 36") [914 mm X 914 mm].

## STACK INSTALLATION INSTRUCTIONS

1. APPLY A 1/2" THICK MORTAR JOINT TO EXPOSED REFRACTORY SURFACE IN STACK RING LOWER THE BASE STACK SECTION (B) ONTO STACK RING (A) AND FASTEN WITH HARDWARE PROVIDED (NO MORE THAN (2) STACK SECTIONS SHALL BE LIFTED TOGETHER). REPEAT PROCESS FOR REMAINING STACK SECTIONS. IF SECTIONS OF VARYING LENGTHS ARE SUPPLIED, ASSEMBLE AS TO AVOID FLANGES & LIFTING EYES INTERFERING WITH RAIN COLLAR LOCATION.
2. INSTALL STORM COLLAR ON STACK, 3" [72 mm] ABOVE NON-COMBUSTIBLE LINER (FLASHING), ALLOWING FOR PROPER VENTILATION (SEE DETAIL).
3. APPLY A 1/4" [6 mm] BEAD OF HIGH-TEMPERATURE SILICON SEALANT (PROVIDED BY MCD) TO THE JOINT BETWEEN THE STORM COLLAR (C) AND THE STACK (B).
4. STORM COLLAR IS FURNISHED BY MCD. THE NON-COMBUSTIBLE LINER (FLASHING) TO BE PROVIDED BY THE OTHERS.
5. IF FIFTY PERCENT OF THE STACK LENGTH IS ABOVE THE ROOF, GUY WIRES MAY BE REQUIRED. CONSULT WITH YOUR MCD REP.
6. RAIN CAP NOT REQUIRED.



36" [.91 m] MINIMUM STACK ABOVE ROOF PEAK (MAY VARY BY LOCATION).



STACK INSTALLATION  
DETAIL

ROOF PENETRATION  
DETAIL



2045 Sprint Boulevard  
Apopka, Florida 32703  
USA

SUPER POWER-PAK III

STACK DETAILS, CLEARANCES &  
INSTALLATION INSTRUCTIONS.  
REFRACTORY STACK DETAIL

DATE:	10-26-06	SCALE:	1/2"=1'
DRAWN:	JG	PLOT SCALE:	1:24
APRVD		SHEET:	2 OF 2
DWG FILE:	SPPIII-MarketingStackRefs2R3		
DWG #:	0000196		

## SPECIFICATIONS- Model Super Power-Pak

1. Equipment Type ..... Super Power-Pak
  - A. Model No. .... IE43-SPP
  - B. Underwriters Laboratories Listing and File No. ... 87E8; MH14647
  
2. Dimensions
  - A. Footprint ..... 10' – 0" x 7' – 4"
  - B. Maximum Length ..... 12' – 2" (3.7 m)
  - C. Maximum Width ..... 8' -7" (2.62 m)
  - D. Maximum Height ..... 9' - 6¾" (2.91 m)
  - E. Chamber Loading Opening ..... 33" H x 39" W (838 mm x 991 mm)
  
3. Weight ..... 32,000 lbs. (14,500 kg)
  
4. Utility/Air Requirements
  - A. Gross Gas Input, Natural or LP Gas ..... 2,000,000 BTU/hr. (2,100,000 kJ/h)  
2,500,000 BTU/hr. (2,600,000 kJ/h) if equipped with preheat burner
    - Running Gas Pressure, Natural Gas ..... 7 inches (180 mm) water column or greater
    - Running Gas Pressure, LP Gas ..... 11 inches (280 mm) water column or greater
  - B. Electrical Supply ..... 230 volt, 3Ø or 1Ø, 50/60 hz (other available)
  - C. Air Supply ..... 2,500 cfm (70 standard m<sup>3</sup>/min)
  
5. Incineration Capacity ..... 200 lbs./hr. (91 kg/h)
  
6. Construction and Safety Standards ..... Incineration Institute of America, Underwriters Laboratories, Canadian Standards Association
  
7. Steel Structure Construction
  - A. Frame ..... 2" ( 51 mm) square tubing
  - B. Front/Rear Plates ..... 3/8" (10 mm) plate
  - C. Floor Plates ..... 3/16" (5 mm) plate
  - D. Outer Side Casing ..... 12 gauge (3 mm) plate
  - E. Inner Side Casing ..... 12 gauge (3 mm) plate
  
8. Stack Construction
  - A. Inner Wall ..... 4 1/2" (110 mm) insulating firebrick or castable
  - B. Outer Wall ..... 12 gauge (3 mm) sheet, 304 s.s., welded seams (unlined stack available)
  
9. Draft Nozzle Construction ..... Schedule 40 type 316 s.s., welded connections
  
10. Main Chamber Door Construction
  - A. Steel Shell ..... 3/16" (5 mm) steel, welded with reinforcement
  - B. Outer Refractory ..... 1" (25 mm) insulating block
  - C. Inner Refractory ..... 4½" (110 mm) insulating firebrick
  
11. Primary Chamber Wall Construction
  - A. Outer Casing Wall ..... 12 gauge (3 mm) sheet

## SPECIFICATIONS- Model Super Power-Pak

- B. Inner Frame/Air Compartment ..... 2" (51 mm) air compartment
- C. Inner Casing Wall ..... 12 gauge (3 mm) sheet
- D. Outer Refractory Wall ..... 5" (127 mm) insulating block (minimum)
- E. Inner Refractory Wall ..... 4½" (110 mm) firebrick
  
- 12. Secondary Chamber Wall Construction
  - A. Outer Casing Wall..... 12 gauge (3 mm) sheet
  - B. Inner Frame/Air Compartment ..... 2" (51 mm) air compartment
  - C. Inner Casing Wall ..... 12 gauge (3 mm) sheet
  - D. Outer Refractory Wall ..... 6" (150 mm) insulating block
  - E. Inner Refractory Wall ..... 4½" (110 mm) firebrick
  
- 13. Refractory Temperature Ratings
  - A. Standard Firebrick..... 3,100° F. (1700° C)
  - B. Insulating Firebrick..... 2,600° F. (1430° C)
  - C. Castable Refractory (Hearth) ..... 2,550° F. (1370° C)
  - D. Castable Refractory ..... 2,550° F. (1370° C)
  - E. Insulating Block..... 1,900° F. (1040° C)
  - F. Bonding Mortar ..... 3,200° F. (1760° C)
  
- 14. Chamber Volumes (not including external flues, stacks or chimneys)
  - A. Primary Chamber..... 61 cubic feet (1.7 m<sup>3</sup>)
  - B. Secondary Chamber ..... 99 cubic feet (2.8 m<sup>3</sup>)
  
- 15. Emission Control Features
  - A. Secondary Chamber with Afterburner ..... Included
  - B. Opacity Monitor and Controller with Visual and Audible Alarms..... Included
  - C. Auxiliary Air Control System..... Included
  - D. Microprocessor Temperature Control System..... Included
  
- 16. Operating Temperatures
  - A. Primary Chamber..... 1,200° F. - 1,800° F. (650° C - 1000° C)
  - B. Secondary Chamber ..... 1,400° F. - 1,800° F. (760° C - 1000° C) as required
  
- 17. Secondary Chamber Retention Time..... > 1 second
  
- 18. Ash Removal ..... Door functions as a heat shield. Sweep out beneath rear door into hopper that fills collection pan.
  
- 19. Safety Interlocks
  - A. High Gas Pressure..... Optional
  - B. Low Gas Pressure ..... Optional
  - C. Blower Air Pressure ..... Included
  - D. Door Position ..... Included
  - E. Opacity ..... Included
  - F. Motor Starter Function ..... Included
  - G. Chamber Temperature..... Included

SPECIFICATIONS- Model Super Power-Pak

- H. Motor Overload ..... Included
- I. Flame Quality..... Included
- J. Burner Safe Start ..... Included
  
- 20. Burner Description ..... The nozzle mix burners used on this cremation equipment are industrial quality and designed for incinerator use.
  
- 21. Ultraviolet Flame Detection..... Ultraviolet flame detection has proven to be the most reliable means of flame safety. The system is completely sealed in a quartz capsule to eliminate problems, caused by moisture and dust created in the cremation process, which effect flame rod detectors.
  
- 22. Operating Panel Indicating Lights
  - A. Safe Run..... Included
  - B. Door Closed..... Included
  - C. Pollution Alarm..... Included
  - D. Afterburner On (Secondary Burner)..... Included
  - E. Cremation Burner On..... Included
  - F. Temperature Control..... Included
  - G. Afterburner (Secondary Burner) Reset..... Included
  - H. Cremation Burner Reset ..... Included
  - I. Hearth Air..... Included
  - J. Throat Air Off ..... Included
  
- 23. Automatic Timer Functions
  - A. Master Cycle..... Included
  - B. Afterburner (Secondary Burner)..... Included
  - C. Cremation Burner..... Included
  - D. Low Fire Cremation Burner ..... Included
  - E. Hearth Air..... Included
  - F. Throat Air..... Included
  - G. Pollution Monitoring ..... Included
  - H. Afterburner (Secondary Burner) Prepurge ..... Included
  - I. Cremation Burner Prepurge..... Included
  - J. Cool Down ..... Included
  
- 24. Exterior Finish
  - A. Primer ..... 2 coats rust inhibiting
  - B. Finish ..... 2 coats textured finish
  
- 25. Start-Up and Training ..... Startup of cremation equipment and training of operators to properly operate and maintain the equipment is performed on-site under actual operating conditions. Included is a comprehensive owner's manual, with details on the equipment, its components and proper operation.



Air Emissions Testing

IE43-SPP, Super Power-Pak Cremator

Metro Crematory, Inc.  
Ocoee, Florida

April 23, 2003

Testing Performed By:

Southern Environmental Sciences, Inc.

## 1.0 INTRODUCTION

Southern Environmental Sciences, Inc. conducted emissions testing of the Industrial Equipment & Engineering Company Model IE43-SPP, Super Power-Pak cremator on April 23, 2003. The unit is located at Metro Crematory, Inc.; 751 South Bluford Ave.; Ocoee, Florida 34761. Testing was conducted for the particulates, carbon monoxide, and visible emissions. Oxygen ( $O_2$ ) concentrations were measured in order to correct results to 7%  $O_2$ .

## 2.0 SUMMARY OF RESULTS

The equipment was found to be in compliance with all applicable emission limiting standards. Results of the particulate and carbon monoxide testing are summarized in Table 1.

The average measured particulate emission concentration was 0.033 grains per dry standard cubic foot (corrected to 7%  $O_2$ ).

The average measured carbon monoxide emission concentration was 16.5 parts per million by volume (corrected to 7%  $O_2$ ).

A visible emissions evaluation was conducted over a 60-minute period. The maximum three minute average opacity was 0 percent.

The testing personnel detected no objectionable odor during the stack test.

Mr. Gregory Bryant of the Orange County Environmental Protection Division was present for the testing.

### 3.0 PROCESS DESCRIPTION

The IE43-SPP, Super Power-Pak cremator is a gas fired, multiple chamber design. A human body enclosed in a wooden or cardboard container or animal tissue is loaded into the primary chamber. The afterburner ignites and heats the secondary chamber to the required temperature. A process controller that automatically modulates the gas supply to the afterburner maintains the secondary chamber temperature.

After the secondary chamber has been heated sufficiently, the cremation burner ignites and the cremation process is initiated. A typical cremation takes 60 to 90 minutes, but the time may vary depending on the body weight and various other factors.

A gas flow schematic is shown in Figure 1. Process rates for the test are included in the appendix.

## EMISSIONS TEST SUMMARY

REVISED 6/6/03

Company: METRO CREMATORY, INC.

Source: IE43-SUPER POWER PAK HUMAN CREMATORY

	Run 1	Run 2	Run 3	
Date of Run	4/23/03	4/23/03	4/23/03	
Start Time (24-hr. clock)	1048	1410	1631	
End Time (24-hr. clock)	1160	1515	1734	
Vol. Dry Gas Sampled Meter Cond. (DCF)	42.008	38.747	41.028	
Gas Meter Calibration Factor	1.012	1.012	1.012	
Barometric Pressure at Barom. (in. Hg.)	30.02	30.01	29.97	
Elev. Diff. Manom. to Barom. (ft.)	0	0	0	
Vol. Gas Sampled Std. Cond. (DSCF)	41.027	37.645	39.507	
Vol. Liquid Collected Std. Cond. (SCF)	5.003	4.583	4.140	
Moisture in Stack Gas (% Vol.)	10.9	10.9	9.5	
Molecular Weight Dry Stack Gas	30.00	30.00	30.00	
Molecular Weight Wet Stack Gas	28.70	28.70	28.86	
Stack Gas Static Press. (in. H <sub>2</sub> O gauge)	-0.04	-0.04	-0.05	
Stack Gas Static Press. (in. Hg. abs.)	30.02	30.01	29.97	
Average Square Root Velocity Head	0.208	0.183	0.191	
Average Orifice Differential (in. H <sub>2</sub> O)	1.530	1.262	1.435	
Average Gas Meter Temperature (°F)	91.0	93.3	97.8	
Average Stack Gas Temperature (°F)	1061.5	1067.7	1097.0	
Pitot Tube Coefficient	0.84	0.84	0.84	
Stack Gas Vel. Stack Cond. (ft./sec.)	19.9	17.54	18.43	
Effective Stack Area (sq. ft.)	2.41	2.41	2.41	
Stack Gas Flow Rate Std. Cond. (DSCFM)	891	782	818	
Stack Gas Flow Rate Stack Cond. (ACFM)	2,872	2,532	2,660	2688
Net Time of Run (min.)	60.0	60.0	60.0	
Nozzle Diameter (in.)	0.598	0.598	0.598	
Percent Isokinetic	94.7	99.0	99.4	
Oxygen (%)	12.9	13.2	13.9	
Particulate Collected (mg.)	18.9	71.2	43.2	
				<u>Average</u>
Particulate Emissions (gr./DSCF)	0.007	0.029	0.017	0.018
Particulate Emissions (gr./DSCF @ 7% O <sub>2</sub> )	0.012	0.052	0.034	0.033
Particulate Emissions (lb./hr.)	0.100	0.200	0.100	0.133
CO Emissions (ppm)	18.90	4.90	4.00	9.28
CO Emissions (ppm @ 7% O <sub>2</sub> )	32.70	8.80	7.90	16.50
CO Emissions (lb./hr.)	0.074	0.017	0.014	0.035

Note: Standard conditions 68°F, 29.92 in. Hg