STATE OF MISSOURI
Jeremiah W. (Jay) Nixon, Governor • Sara Parker Pauley, Director
DEPARTMENT OF NATURAL RESOURCES
www.dnr.mo.gov

JUN 2 1 2013

Ms. Heather Dukes
Mason Crematory, LLC
401 NW Essex Dr.
Lee's Summit, MO 64081

RE: New Source Review Permit, Permit by Rule - Project Number: 2013-06-017
Facility ID Number: 095-0338

Dear Ms. Dukes:

Enclosed with this letter is your permit to construct. Please review your permit carefully. You submitted a $700.00 review fee and a completed Permit-By-Rule Notification, received on June 4, 2013..

Section A and Section B of your permit application "General Notification Information for Authority to Construct" and "Special Conditions for Crematories and Animal Incinerators" are part of your permit. The entire permit must be retained in your files. The reverse side of your permit certificate has important information concerning standard permit conditions and your rights and obligations under the laws and regulations of the State of Missouri. Operation in accordance with these conditions is necessary for continued compliance.

In order to streamline the permitting process, the initial on-site compliance inspection requirement (which is mandatory prior to issuance of a permit) has been waived. However, an on-site compliance inspection will be performed at a later date, to validate your statements and conditions claimed on the permit by rule notification. If you have any questions regarding this permit, please contact James Broadfoot, at the Departments' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102, or by telephone at (573) 751-4817.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Kendall B. Hale

Kendall B. Hale
Permits Section Chief

KBH:jbl

Enclosures

c: Kansas City Regional Office
PAMS File 2013-06-017
Permit Number: 062013-011

Missouri Department of Natural Resources
Missouri Air Conservation Commission
Air Pollution Control Program

PERMIT TO CONSTRUCT

PERMIT BY RULE

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct and operate the air contaminant source(s) described below, in accordance with the laws, rules, and conditions set forth here in.

Construction Permit Number: 062013-011
Project Number: 2013-06-017
Installation ID: 095-0338

Installation Name and Address
Mason Crematory, LLC
401 NW Essex Dr.
Lee's Summit, MO 64081
Jackson County

Parent Company's Name and Address
Ms. Heather Dukes
Mason Crematory, LLC
401 NW Essex Dr.
Lee's Summit, MO 64081
Jackson County

Installation Description:
Installation of a Matthews Cremation Power Pak II Plus (IE43-PPII Plus) human cremation unit.

JUN 21 2013
Effective Date

Kyra L Moore
Director or Designee
Department of Natural Resources

STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 and 10 CSR 10-6.062 if you fail to adhere to the specifications and conditions listed in your permit by rule application and this permit. Specifically, all air contaminant control devises shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the Department of Natural Resources Regional office responsible for the area within which the equipment is located within 15 days after the actual start up of this air contaminant source.

A copy of this permit and permit notification shall be kept at the installation address and shall be made available to Department of Natural Resources' personnel upon request.

You may appeal this permit or any of the listed special conditions as provided in RSMo 643.075. If you choose to appeal, the Air Pollution Control Program must receive your written declaration within 30 days of receipt of this permit.

If you choose not to appeal, this certificate, the project review, your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant sources(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Department of Natural Resources has established the Out reach and Assistance Center to help in completing future applications or fielding complaints about the permitting process. You are invited to contact them at 1-800-361-4827 or (573) 526-6627, or you can write to the Outreach and Assistance Center, P.O. Box 176, Jefferson City, MO 65102-0176.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit at (573) 751-4817. If you prefer to write, please address your correspondence to the Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176, Attention: Construction Permit Unit.

64132 0950338

MISSOURI DEPARTMENT OF NATURAL RESOURCES
AIR POLLUTION CONTROL PROGRAM
P.O. BOX 176, JEFFERSON CITY, MO 65102-0176

APPLICATION FOR AUTHORITY TO CONSTRUCT PERMIT BY RULE NOTIFICATION

CREMATORIES AND ANIMAL INCINERATORS

APCP USE ONLY	
CHECK NO. 11472	CHECK RECEIVED (MM/DD/YY) 6-4-13
CHECK AMOUNT $100.00	CHECK DATE (MM/DD/YY) 6-3-13
PROJECT NO. 2013-06-017	PERMIT NO.

SECTION A: GENERAL NOTIFICATION INFORMATION – ALL NOTIFICATIONS MUST BE ACCOMPANIED BY A $700 FEE.

SECTION A-1: GENERAL INSTALLATION INFORMATION

1. INSTALLATION NAME	2. FIPS	3. PLANT NO.
Mason Crematory, L.L.C.		

4. INSTALLATION STREET ADDRESS
8520 Prospect Ave

5. INSTALLATION MAILING ADDRESS
401 NW 65508 DR Lees Summit Mo 64081

6. CITY	STATE	ZIP CODE
Kansas City	MO	64132

7. COUNTY NAME	8. 1/4, of 1/4, of SECTION TOWNSHIP RANGE
Jackson	

9. PARENT COMPANY

10. PARENT COMPANY MAILING ADDRESS

11. CITY	STATE	ZIP CODE

12. INSTALLATION CONTACT PERSON	13. CONTACT PERSON'S TITLE
Heather Dukes	Member

14. CONTACT PERSON'S MAILING ADDRESS
401 NW 65508 DR Lees Summit Mo 64081

15. INSTALLATION CONTACT TELEPHONE NO.	16. INSTALLATION CONTACT FAX NO.
(816) 728-0278	( )

17. INSTALLATION CONTACT E-MAIL ADDRESS
dukesheather@hotmail.com

18. PROJECTED DATE TO COMMENCE CONSTRUCTION	19. PROJECT DATE OF OPERATION STARTUP
6·15·13	7·15·13

SECTION A-2: INSTALLATION DESCRIPTION

20.

Installation of a Matthews Cremation Power Pak II Plus (IE43-PPII plus) human cremation unit.

RECEIVED 2013 JUN -4 PM 2:52 AIR POLLUTION CONTROL PGM

SECTION A-3: CERTIFICATION STATEMENT

I certify that I have personally examined and am familiar with the information in this application and believe that the information submitted is accurate and complete. I am aware that making a false statement or misrepresentation in this application is grounds for denying or revoking this permit.

21. SIGNATURE OF RESPONSIBLE OFFICIAL	22. DATE
Heather Dukes	6/3/13

23. TYPE OR PRINT NAME OF RESPONSIBLE OFFICIAL	24. RESPONSIBLE OFFICIAL'S TELEPHONE NUMBER
Heather Dukes	(816) 728-0278

25. TITLE OF RESPONSIBLE OFFICIAL
Member

SECTION B: SPECIAL CONDITIONS FOR CREMATORIES AND ANIMAL INCINERATORS

Construction and operation of this new air pollution source is subject to the special conditions listed below. These special conditions are based on the authority granted to the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically RSMo 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.062 *"Construction Permits by Rule"*).

Please indicate by marking the appropriate box as to whether or not the emission source complies with the rule listed in the applicable emission limit or standard. If any of the applicable emission source boxes are checked no, your source is not eligible for a crematories and animal incinerators permit by rule.

This Permit By Rule applies only to Crematories and Animal Incinerators constructed after October 31, 2003.

SPECIAL CONDITION	EMISSION SOURCE COMPLY?	APPLICABLE EMISSION LIMIT OR STANDARD	METHOD OF COMPLIANCE
10 CSR 10-6.062(3)(B)2.A.	☒ YES ☐ NO	The materials to be disposed of shall be limited to noninfectious human materials removed during surgery, labor and delivery, autopsy, or biopsy including body parts, tissues and fetuses, organs, bulk blood and body fluids, blood or tissue laboratory specimens, and other noninfectious anatomical remains or animal carcasses in whole or in part. The owner or operator shall minimize the amount of packaging fed to the incinerator, particularly plastic containing chlorine. The incinerators shall not be used to dispose of other non-biological medical wastes including, but not limited to, sharps, rubber gloves, intravenous bags, tubing, and metal parts.	Proper work practice.
10 CSR 10-6.062(3)(B)2.B.	☒ YES ☐ NO	The manufacturer's rated capacity (burn rate) shall be two hundred (200) pounds per hour or less.	Proper work practice.
10 CSR 10-6.062(3)(B)2.C.	☒ YES ☐ NO	The incinerator shall be a dual-chamber design.	Proper work practice.
10 CSR 10-6.062(3)(B)2.D.	☒ YES ☐ NO	Burners shall be located in each chamber, sized to manufacturer's specifications, and operated as necessary to maintain the minimum temperature requirements of subparagraph 10 CSR 10-6.062(3)(B)2.E. at all times when the unit is burning waste.	Proper work practice.
10 CSR 10-6.062(3)(B)2.E.	☒ YES ☐ NO	Excluding crematories, the second chamber must be designed to maintain a temperature of one thousand six hundred degrees Fahrenheit (1,600°F) or more with a gas residence time of one-half (1/2) second or more. The temperature shall be monitored with equipment that is accurate to plus or minus two percent (±2%) and continuously recorded. The thermocouples or radiation pyrometers shall be fitted to the incinerator and wired into a manual reset noise alarm such that if the temperature of either of the two (2) chambers falls below the minimum temperature above, the alarm will sound at which time plant personnel shall take immediate measures to either correct the problem or cease operation of the incinerator until the problem is corrected	Proper work practice and maintenance of proper alarm records. These records shall be maintained for not less than five (5) years, and they shall be immediately available to any Missouri Department of Natural Resources personnel upon request.
10 CSR 10-6.062(3)(B)2.F.	☒ YES ☐ NO	There shall be no obstruction to stack flow, such as by rain caps, unless such devices are designed to automatically open when the incinerator is operated. Properly installed and maintained spark arresters are not considered obstructions.	Proper work practice.

SECTION B: SPECIAL CONDITIONS FOR CREMATORIES AND ANIMAL INCINERATORS (CONTINUED)			
SPECIAL CONDITION	EMISSION SOURCE COMPLY?	APPLICABLE EMISSION LIMIT OR STANDARD	METHOD OF COMPLIANCE
10 CSR 10-6.062(3)(B)2.G.	☒ YES ☐ NO	Each incinerator operator shall be trained in the incinerator operating procedures as developed by the American Society of Mechanical Engineers (ASME), by the incinerator manufacturer, or by a trained individual with more than one (1) year experience in the operation of the incinerator that the trainee will be operating. Minimum training shall include basic combustion control parameters of the incinerator and all emergency procedures to be followed should the incinerator malfunction or exceed operating parameters. An operator who meets the training requirements of this condition shall be on duty and immediately accessible during all periods of operation. The manufacturer's operating instructions and guidelines shall be posted at the unit and the unit shall be operated in accordance with these instructions.	Proper work practice and maintenance of proper operator training records. These records shall be maintained for not less than five (5) years, and they shall be immediately available to any Missouri Department of Natural Resources personnel upon request.
10 CSR 10-6.062(3)(B)2.H.	☒ YES ☐ NO	The incinerator shall have an opacity of less than ten percent (10%) at all times.	Proper work practice such that no opacity violations are noted.
10 CSR 10-6.062(3)(B)2.I.	☒ YES ☐ NO	Heat shall be provided by the combustion of natural gas, liquid petroleum gas, or Number 2 fuel oil with less than three-tenths percent (0.3%) sulfur by weight, or by electric power.	Proper work practice.
10 CSR 10-6.062(3)(B)2.J.	☒ YES ☐ NO	The operator shall maintain a log of all alarm trips and the resulting action taken. A written certification of the appropriate training received by the operator, with the date of training, that includes a list of the instructor's qualifications or ASME certification school shall be maintained for each operator. The operator shall maintain an accurate record of the monthly amount and type of waste combusted.	Determined through proper alarm and operator training record keeping. These records shall be maintained for not less than five (5) years, and they shall be immediately available to any Missouri Department of Natural Resources personnel upon request.

SECTION C: OTHER POTENTIALLY APPLICABLE REQUIREMENTS

This section is intended to identify regulations that may apply to this installation. There may be others not listed that apply. To determine rule applicability and specific standards, please consult the appropriate sections in the Code of Federal Regulations (CFR) and Code of State Regulations (CSR) for the full text of the applicable requirements.

Please note: this permit allows you to construct and operate your air contaminant source(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources, and other applicable federal, state, and local laws and ordinances.

REGULATION OR CONSTRUCTION PERMIT REFERENCE	APPLICABLE EMISSION LIMIT OR STANDARD	METHOD OF COMPLIANCE
10 CSR 10-2.100, 10-3.030, or 10-4.090, 10-5.070 Open Burning Restrictions	Shall not conduct, cause, permit or allow a salvage operation, the disposal of trade wastes or burning of refuse by open burning.	Any person intending to engage in open burning shall submit a request to the Director.
10 CSR 10-2.070, 10-3.090 or 10-4.070, Restriction of Emission of Odors	No person may cause, permit or allow the emission of odorous matter in concentrations and frequencies or for durations that odor can be perceived when air is diluted to 1:7 volumes of odorous to odor-free air for 2 separate trails not less than 15 minutes apart within 1 hour.	No odor violations noted, if and when scentometer readings are taken.
10 CSR 10-5.160 Control of Odors in the Ambient Air	No person shall emit odorous matter as to cause an objectionable odors unless within the limits established by this rule.	No odor violations noted, if an when scentometer readings are taken.
10 CSR 10-5.170 Control of Odors From Processing Animal Matter	No person shall operate or use any device, machine, equipment, or other contrivance for the reduction of animal matter unless all gases, vapors, and gas-entrained effluents from the facility are incinerated at a temperature of not less than 1,200°F for a period of not less than 0.3 seconds and otherwise in compliance with this rule.	Proper work practice.
10 CSR 10-6.050, Start-up, Shutdown and Malfunction Conditions	Shall not commence construction or modification of any installation subject to this rule; begin operation after construction or modification; or begin operation of any installation which has been shut down longer than 5 years without first obtaining a permit.	In the event of a malfunction, which results in excess emissions that exceed 1 hour, the permittee shall implement corrective action and submit reports.
10 CSR 10-6.065, Operating Permits	The permittee shall comply with all applicable requirements identified in the operating permit (OP); file for timely renewal of this OP; and retain a copy of the OP on-site and make available to any MDNR personnel upon request.	The permittee shall submit an annual compliance certification in accordance with the regulation. The permittee shall maintain a current equipment list on-site with the date of installation of the equipment.
10 CSR 10-6.110, Submission of Emission Data, Emission Fees and Process Information	Submittal of Emission Inventory Questionnaire (EIQ) and emission fees by frequency noted in 10 CSR 10-6.110.	The permittee shall complete and submit an EIQ in accordance with 10 CSR 10-6.110.
10 CSR 10-6.200 Hospital, Medical, Infectious Waste Incinerators	No owner or operator shall cause to be discharged into the atmosphere any gases that contain stack emissions in excess of those listed in 10 CSR 10-6.200(3)(A).	Proper work practice and maintenance of appropriate performance test results.
10 CSR 10-6.070 New Source Performance Regulations	The following federal NSPS standards may apply: (Ec) Medical Waste Incinerators. Standards of Performance for Incinerators.	As required by regulations.

MISSOURI DEPARTMENT OF NATURAL RESOURCES
AIR POLLUTION CONTROL PROGRAM

APPLICATION FOR AUTHORITY TO CONSTRUCT
PERMIT BY RULE NOTIFICATION
CREMATORIES AND ANIMAL INCINERATORS

INSTRUCTIONS

By submitting your notification, you are accepting all conditions and terms stated in this form. If you find the special conditions listed in Section B unacceptable, you may choose to submit a construction permit application and undergo a case-by-case review.

Please refer to the following line-by-line instructions to complete the notification. The notification, along with the $700.00 fee, should be mailed to:

Air Pollution Control Program
Permit-By-Rule
P.O. Box 176
Jefferson City, Missouri 65102

You must also retain a copy of the notification at the installation and make it immediately available to any inspector.

Once the fee and notifications have been mailed or hand-delivered, you are free to begin construction of your project under the special conditions that you have accepted.

The Air Pollution Control Program will send you a letter acknowledging receipt of your notification with a permit number and a project number for agency tracking purposes.

A copy of this electronic package may be obtained from the Department of Natural Resources Air and Land Protection Division's web site at: http://www.dnr.mo.gov/alpd/apcp/PermitInfo.htm.

If you have any questions about the notification form or the permit-by-rule notification procedure, please feel free to contact the Permit Section at (573) 751-4817.

NOTIFICATION FORM INSTRUCTIONS

1.) **Installation Name:** Enter the official company name and/or plant designation for the installation that is making the permit-by-rule notification.

2.) **FIPS Number:** Enter the official FIPS Number (3 digit code) which corresponds to the county name for the county in which the installation is located. Please refer to http://www.itl.nist.gov/fipspubs/co-codes/mo.txt for a listing. The FIPS number in combination with the Plant Number provides the identification/tracking information for the installation in the State/Federal databases.

3.) **Plant Number:** Enter the official Plant Number that has been assigned to the installation by the respective State or Local Agencies. If you do not know your plant number, please leave blank.

4.) **Installation Street Address:** Enter the street address of the physical location of installation.

5.) **Installation Mailing Address:** Enter the mailing address if that address is different from the street address.

6.) **City, State and Zip Code:** Enter the City, State and Zip Code of the physical location of the installation.

7.) **County:** Enter the county in which the installation is located.

8.) **Section, Township, Range:** Enter the appropriate information on the Section, Township and Range in which the installation is located.

9.) **Parent Company:** Complete this block if this installation is totally or partially owned by another company.

10.) **Parent Company Mailing Address:** Complete this block if this installation is totally or partially owned by another company.

11.) **Parent Company City, STate and Zip Code:** Complete this block if this installation is totally or partially owned by another company.

12.) **Installation Contact Person:** Enter the name of the person who is most familiar with the operations of the installation and who can answer any questions regarding information about the installation.

13.) **Contact Person's Title:** Enter the title of the contact person.

14.) **Contact Person's Mailing Address:** Enter the mailing address for the Contact Person.

15.) **Installation Contact Person's Telephone Number:** Enter the Contact Person's telephone number.

16.) **Installation Contact Person's Fax Number:** Enter the Contact Person's fax number.

17.) **Installation Contact Person's E-Mail Address:** Enter the Contact Person's e-mail address.

18.) **Projected Date to Commence Construction:** Enter the date you intend to commence construction of your installation.

19.) **Projected Date of Operation Startup:** Enter the date you plan to begin operation with the installation.

20.) **Installation Description:** Enter the general product manufactured, the material handled by your installation and principal activity that is performed at this installation.

21.) **Signature of Responsible Official:** Enter the signature of the installation's official, certifying that the notification is accurate and complete. Notifications without a signed certification are not considered complete. A responsible official is:

1. The president, secretary, treasurer or vice-president of a corporation in charge of a principal business function, or any other person who performs similar policy and decision-making functions for the corporation or a duly authorization representative of this person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit and either-

   a) The facilities employ more than 250 person or have a gross annual sales or expenditures exceeding twenty-five million dollars (in second quarter 1980 dollars); or

   b) The delegation of authority to his representative is approved in advance by the permitting authority.

2. A general partner in a partnership or the proprietor in a sole proprietorship.

3. Either a principal executive officer or a ranking elected official in a municipality, state, federal, or other public agency. For the purpose of this part, a principal executive officer of a federal agency includes the chief executive officer having responsibility for the operations of a principal geographic unit of the agency; or

4. The designated representative of an affected source insofar as actions, standards, requirements or prohibitions under Title IV of the Clean Air Act or the regulations promulgated under the Act are concerned or the designated representative for any purposes under Part 70.

22.) **Date:** Enter the date that the Signature of the Responsible Official was obtained.

23.) **Type or Print Name of Responsible Official:** Type or print the name of the Responsible Official signing in item 21.

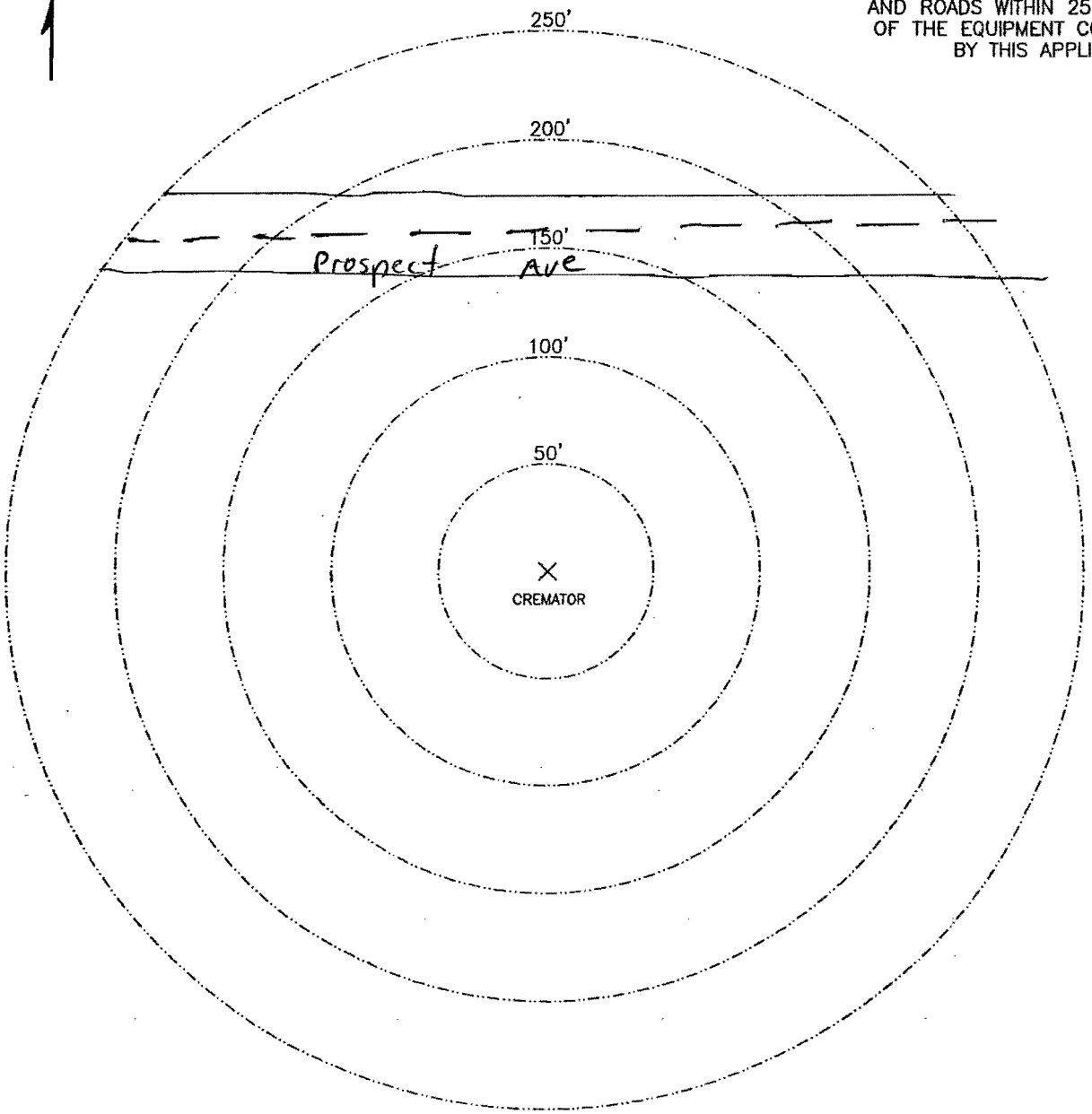
24.) **Responsible Official's Telephone Number:** Enter the telephone number where the Responsible Official may be contacted who signed in item 21.

25.) **Title of Responsible Official:** Enter the official title of the Responsible Official from item 21.

PLOT PLAN

NORTH

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

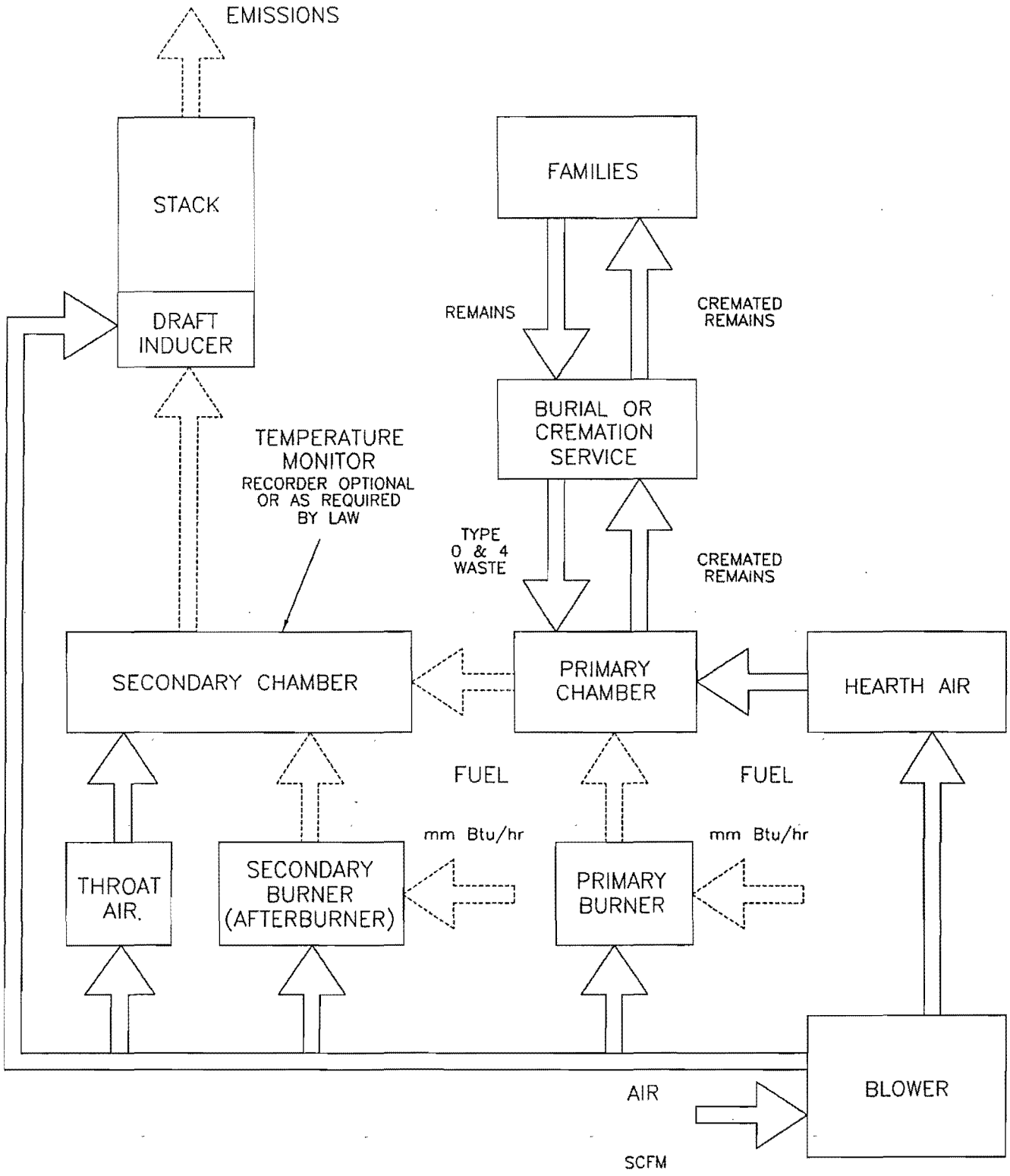


STRUCTURE	DESCRIPTION
(1)	
(2)	
(3)	
(4)	
(5)	
(6)	
(7)	
(8)	
(9)	
(10)	

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.

PROCESS FLOW DIAGRAM
CREMATOR



MCD University

Cremator Operator Certification Test

This is an open-book test of 45 questions. Circle T or F for True or False, and fill in the blanks.
Please return your test for scoring by either scanning the test or send via fax below.

Cecilia Lombardi - c/o Matthews Cremation Division
Email: clombardi@matw.com
FAX: 407-886-5990

The deadline for returning completed tests is 15 days after the seminar.

Name: MARIO R. FALLA

Company: OLIVET MEMORIAL PARK

Date: ~~05~~ MAY 16 2013

Matthews INTERNATIONAL
Cremation Division

Cremator Operator Certification Test

1. Cremation is the process of reducing human remains to its basic elements in the form of bone fragments through flame, heat and VAPORIZATION.

2. Calcination is the process of reducing human remains to its basic elements in the form of bone fragments through HEAT and vaporization.

(T) F 3. The first recorded pre-planned cremation in the United States took place in Charleston, South Carolina in 1783.

T F (4.) Most major religions accept cremation, with the exception of Buddhism and Orthodox Judaism.

(T) F 5. The air remaining after a fuel has been completely burned or that air supplied in addition to the theoretical quantity is called *excess air*.

(T) F 6. Any refractory construction installed to change direction of flow or velocity of the products of combustion is called a *baffle*.

7. The quantity of heat required to raise one pound of water one degree Fahrenheit is termed a BTU.

8. The amount of waste incinerated per unit time, usually expressed in pounds per hour, is called the BURNING RATE

9. A partition wall between chambers which serves to deflect gases in a downward direction is called a curtain wall or DROP ARCH.

(T) F 10. A manually or automatically controlled device to regulate draft or the rate of flow of air or combustion gases is called a *damper*.

11. Suspended ash particles, charred paper, soot and other partially incinerated matter carried in the products of combustion are called PARTICULATES.

12. The equipment for removing particulates and objectionable materials from the products of combustion by means of sprays or wet baffles is called a GAS WASHER.

13. Heat, fuel and OXYGEN are the three elements required for combustion to take place.

(T) F 14. In cremation, the burner supplies heat to raise the temperature of the cremation chamber to the point where combustion of the human remains and container is possible.

T (F) 15. Generally speaking, human remains with higher body fat levels will take longer to cremate than those with lower body fat levels.

(T) F 16. Oxygen is supplied to the cremation chamber through the burner and air jets.

17. Human remains are made up of 85% moisture, 10% combustible solids, and 5% non-combustible solids and are classified as Type 4 waste.

18. Cremation containers or caskets are made up of 85% combustible solids, 10% moisture, and 5% non-combustible solids and are classified as Type 0 waste.

19. The heat release of human remains per pound is approximately 1000 BTU's. The heat release for caskets/containers per pound is 8500 BTU's.

(T) F 20. Carbon monoxide is created when there is insufficient oxygen, temperature or turbulence.

21. Visible emissions are rated on a scale of 0% to 100%.

22. Hydrogen chloride is produced when PLASTICS containing chlorine are cremated.

(T) F 23. The ability of the operator to evaluate the materials (casket/container and human remains) is the first step in controlling visible emissions.

T (F) 24. The retention time is the amount of time required to complete a cremation.

(T) F 25. Typically, the desired range of operating temperatures if from 1400°F to 1800°F, depending on local environmental requirements.

(T) F 26. Turbulence is the mixing of gases in the cremator's exhaust flow. It is caused by physical obstacles such as baffles and perforated walls.

27. The puffing of smoke out of the charging door during a cremation is usually caused by too much TURBULENCE.

28. Recording, as a control measure, allows the operator to have a WRITTEN record of the process variables.

T (F) 29. The cremation of human remains larger than 300 pounds can be performed using normal techniques and operating procedures.

30. There are two basic design formats for cremation equipment: IN LINE and RETORT.

31. Capacity of a cremation unit means chamber volume or BURNING rate.

(T) F 32. Although cremation equipment may be designed for 100 lb/hr to 300 lb/hr capacities or more, the actual operating capacity will be at a lower performance level.

T (F) 33. Most products of combustion (smoke and odor) given off during the cremation process will be destroyed if subjected to temperatures between 1400°F and 1800°F for a period of 0.5 second to 1 second, whether or not proper mixing (turbulence) takes place.

34. The three 'T's of proper pollution control are TIME - TEMPERATURE - TURBULENCE

T (F) 35. Plastic and fiberglass caskets/containers are acceptable for cremation.

T (F) 36. Pacemakers will not explode and are not a problem for the operator.

(T) F 37. Routine maintenance and service of your cremation equipment is necessary to keep it operating at its full potential.

(T) F 38. All maintenance performed on your cremation equipment should be attempted only by qualified persons. All utilities should be shut off or disconnected prior to performing any maintenance. OSHA lockout procedures should be followed.

(T) F 39. A visual inspection of the stack should take place every 30 days.

(T) F 40. Human remains must never be stacked or placed on the floor.

(T) F 41. A metal ID disc should be placed in the cremation unit on the right hand side near the charging door.

(T) F 42. A roller should be used to assist in loading casketed or containerized human remains into the cremation unit.

43. If all the processed cremated remains will not fit into the cremated remains container, the excess remains should be placed in a SECONDARY container and attached securely to the first container.

T (F) 44. The embalming process eliminates all pathogens by sterilizing the human body.

(T) F 45. Crematories are responsible for developing an Exposure Control Plan.

SPECIFICATIONS- Model Power-Pak II Plus

1. Equipment Type	Model Power-Pak II Plus
A. Model No.	IE43-PPII Plus
B. Underwriters Laboratories Listing and File No. ...	
2. Dimensions	
A. Footprint	13' – 6 ½ " x 5' - 7" (4.13 m x 1.7 m)
B. Maximum Length	15' – 8" (4.78 m)
C. Maximum Width	6' -9" (2.06 m)
D. Maximum Height	8' - 4" (2.54 m)
E. Chamber Loading Opening	25 ¾ " H x 43 ½ " W (654 mm x 1105 mm)
3. Weight	28,000 lbs. (12,700 kg)
4. Utility/Air Requirements	
A. Gross Gas Input, Natural or LP Gas	3,000,000 BTU/hr. (3,165,168 kJ/h)
Running Gas Pressure, LP or Natural Gas	11 inches (279.4 mm) water column or greater
B. Electrical Supply	230 volt, 3Ø or 1Ø, 50/60 hz (other available)
C. Air Supply	2,500 cfm (70.8 standard m^3/min)
5. Incineration Capacity	175 lbs./hr. (79 kg/h)
6. Typical Loading Capacity of Waste Types	750 lbs. (340.2 kg)
7. Construction and Safety Standards	Incineration Institute of America, Underwriters Laboratories, Canadian Standards Association
8. Steel Structure Construction	
A. Frame	2" (51 mm) square tubing
B. Front/Rear Plates	3/8" (9.5 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
9. 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)
10. Draft Nozzle Construction	Schedule 40 type 316 s.s. pipe, welded connections
11. 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

SPECIFICATIONS- Model Power-Pak II Plus

12. Primary 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 ..... 5" (127 mm) insulating block
    - E. Inner Refractory Wall ..... 4½" (114 mm) firebrick

13. 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" (152 mm) insulating block
    - E. Inner Refractory Wall ..... 4½" (114 mm) firebrick

14. Refractory Temperature Ratings
    - A. Standard Firebrick ..... 3,100° F. (1704° C)
    - B. Insulating Firebrick ..... 2,600° F. (1427° C)
    - C. Castable Refractory (Hearth) ..... 2,550° F. (1399° C)
    - D. Castable Refractory ..... 2,550° F. (1399° C)
    - E. Insulating Block ..... 1,900° F. (1038° C)
    - F. Bonding Mortar ..... 3,200° F. (1760° C)

15. Chamber Volumes (not including external flues, stacks or chimneys)
    - A. Primary Chamber ..... 70 cubic feet (2.12 m^3)
    - B. Secondary Chamber ..... 96 cubic feet (2.72 m^3)

16. 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

17. Operating Temperatures
    - A. Primary Chamber ..... 32° F. - 1,800° F. (0° C - 982° C)
    - B. Secondary Chamber ..... 1,400° F. - 1,800° F. (760° C - 982° C) as required

18. Secondary Chamber Retention Time ..... > 1 second

19. Ash Removal ..... Door functions as a heat shield. Sweep out beneath front door into hopper that fills collection pan.

SPECIFICATIONS- Model Power-Pak II Plus

20. 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
    - H. Motor Overload ..... Included
    - I. Flame Quality ..... Included
    - J. Burner Safe Start ..... Included

22. Burner Description ..... The nozzle mix burners used on this cremation equipment are industrial quality and designed for incinerator use.

23. 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.

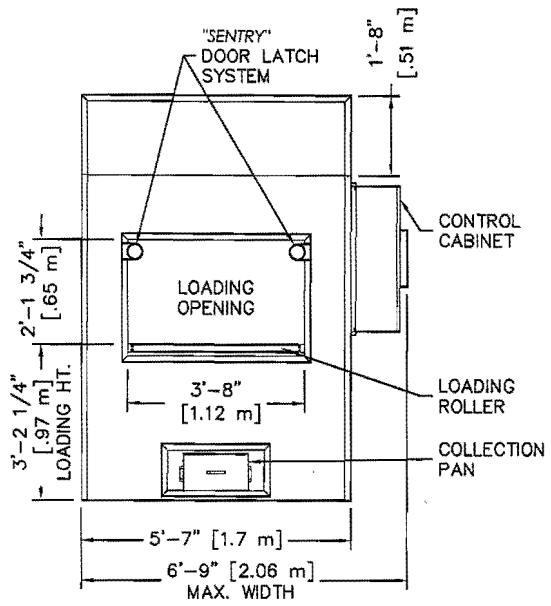
24. Operating Panel Indicating Lights
    - A. Safe Run ..... Included
    - B. Door Closed ..... Included
    - C. Pollution Alarm ..... Included
    - D. Afterburner On (Secondary Burner) ..... Included
    - E. Cremation Burner On ..... Included
    - F. Low Fire Cremation Burner On ..... Included
    - G. Afterburner (Secondary Burner) Reset ..... Included
    - H. Cremation Burner Reset ..... Included
    - I. Hearth Air ..... Included
    - J. Throat Air Off ..... Included

25. 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

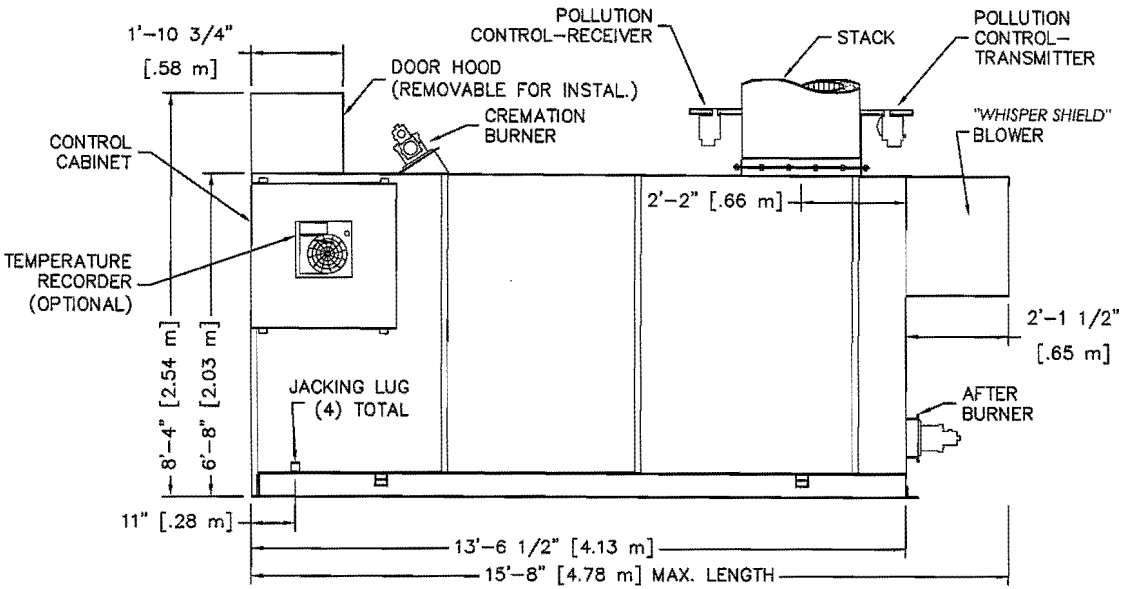
26. Exterior Finish
    - A. Primer ..... 2 coats rust inhibiting
    - B. Finish ..... 2 coats textured finish

SPECIFICATIONS- Model Power-Pak II Plus

27. 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.
28. Environmental Submittals	Complete technical portion of state environmental permits. Engineering calculations, technical data, existing stack test results and equipment blueprints provided.



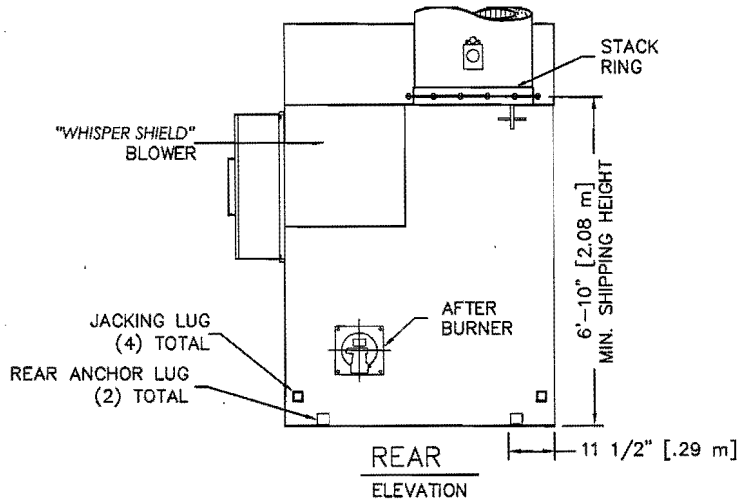
FRONT
ELEVATION



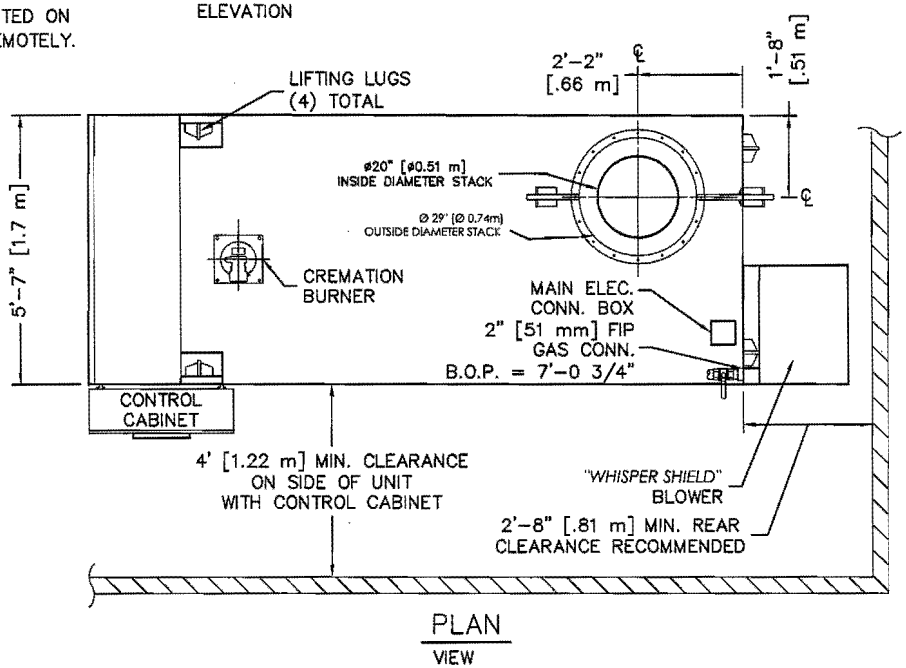
RIGHT SIDE
ELEVATION

NOTES:

1) CONTROL CABINET CAN BE MOUNTED ON THE LEFT OR RIGHT SIDE, OR REMOTELY.
2) CHAMBER WIDTH IS 43" [1.09m].



REAR
ELEVATION



PLAN
VIEW

Matthews
CREMATION DIVISION
2045 Sprint Boulevard
Apopka, Florida 32703
USA

POWER-PAK II - PLUS

PLAN & ELEVATIONS INCL: CLEARANCES, REQUIREMENTS & RECOMMENDATIONS

DATE:	08-16-12	SCALE:	1/4"=1'
DRAWN:	J.Gogel	PLOT SCALE:	1:48
APRVD:		SHEET:	1 OF: 2
DWG FILE:	PPII-PlusMarketingPlanElevR2S1		
DWG #:	0001081		

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 11" [279 mm] W.C. FOR NATURAL GAS AND LP GAS.

CAPACITY: 3.0 MILLION BTU/HR [3.1 MILLION KILOJOULES/HR].

ELECTRICAL: 230 VOLT, 3ø, (40A BREAKER) AND 115v (10A BREAKER), OR 230 VOLT, 1ø, (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.

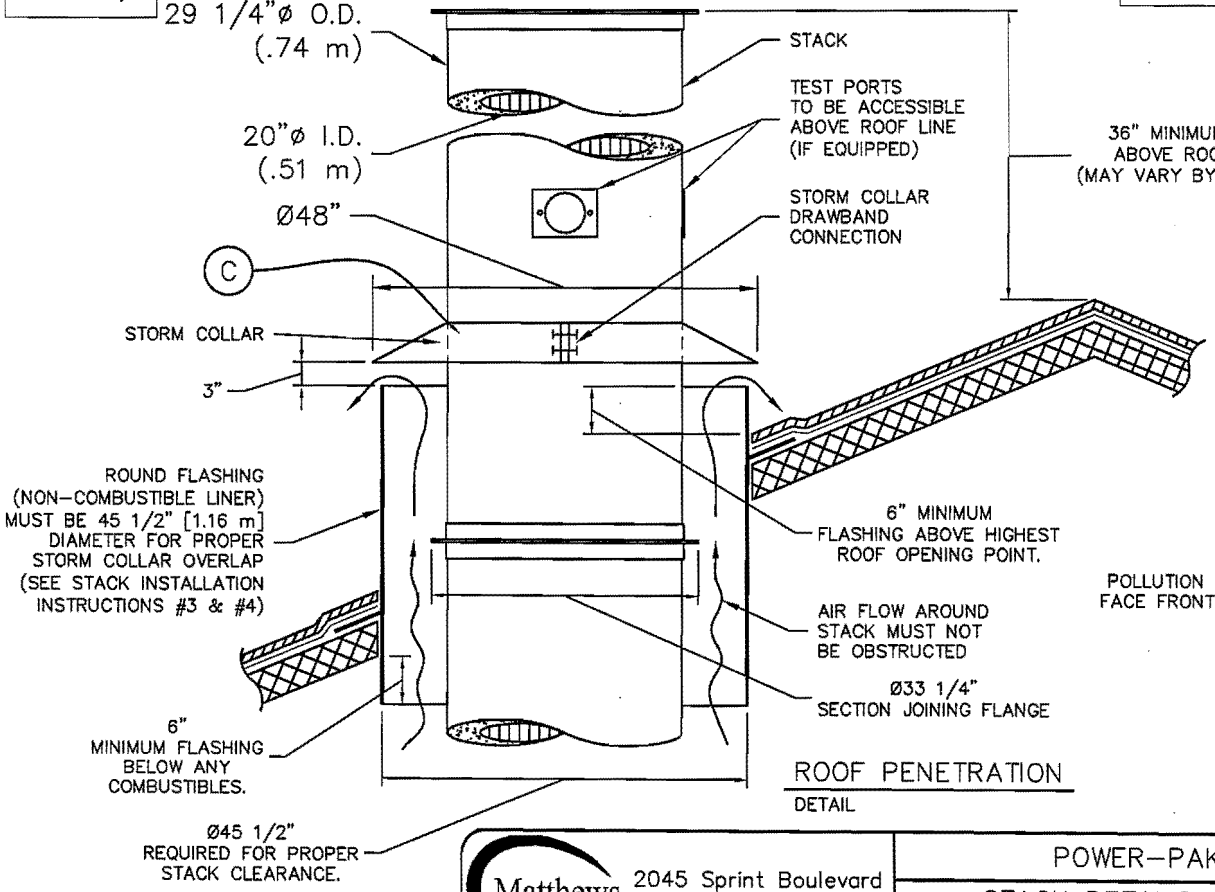
2. INSTALL STORM COLLAR ON STACK, 3" [76 mm] ABOVE NON-COMBUSTIBLE LINER (FLASHING), ALLOWING FOR PROPER VENTILATION (SEE DETAIL).

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).

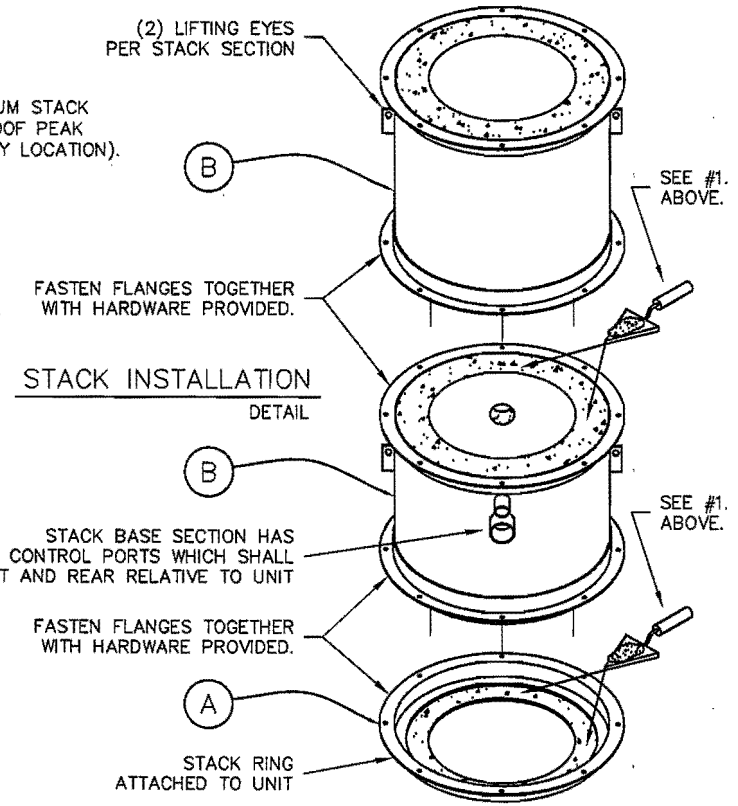
4. STORM COLLAR IS FURNISHED BY MCD. THE NON-COMBUSTIBLE LINER (FLASHING) TO BE PROVIDED BY THE OTHERS.

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.



ROOF PENETRATION
DETAIL



STACK INSTALLATION
DETAIL

Matthews CREMATION DIVISION
2045 Sprint Boulevard
Apopka, Florida 32703
USA

POWER-PAK II (PLUS)

STACK DETAILS, CLEARANCES & INSTALLATION INSTRUCTIONS. REFRACTORY STACK DETAIL

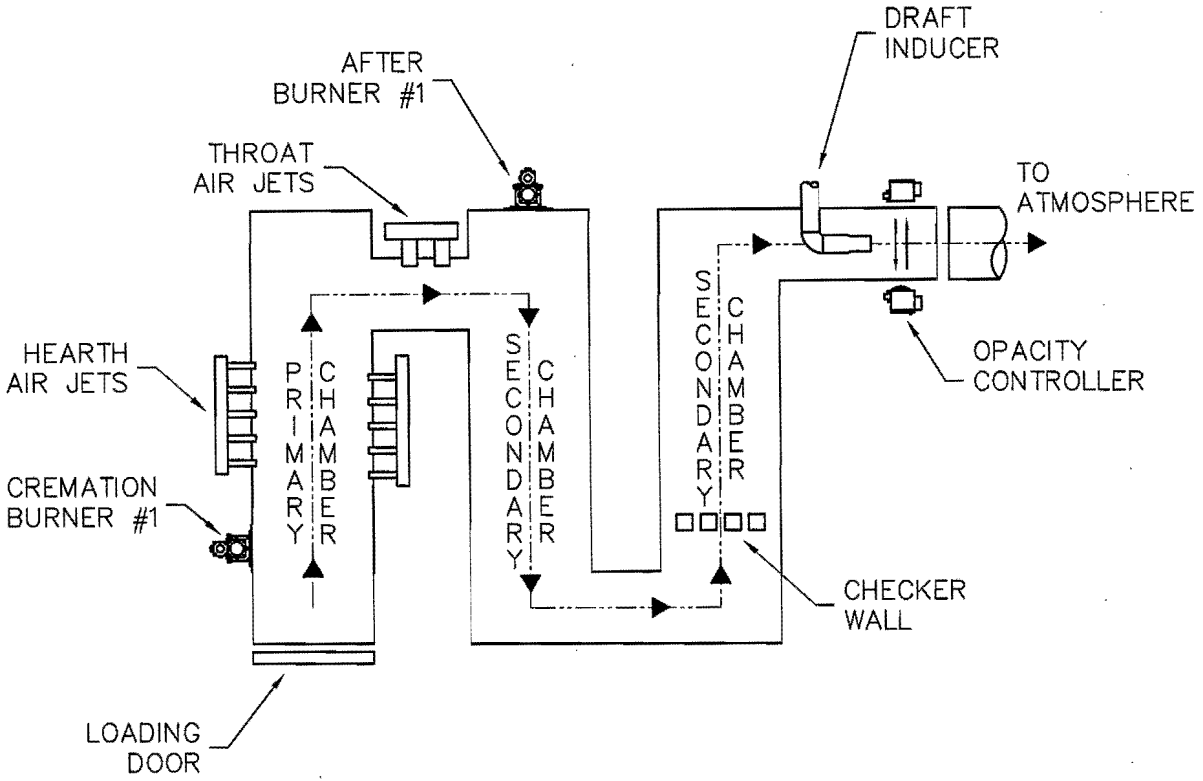
DATE:	05-17-13	SCALE:	1/2"=1'
DRAWN:	JGogel	PLOT SCALE:	1:24
APRVD:		SHEET:	2 OF: 2
DWG FILE:	PPII-PlusMarketingStackRefS2R2		
DWG #:	0001089		

LEGEND OF SYMBOLS

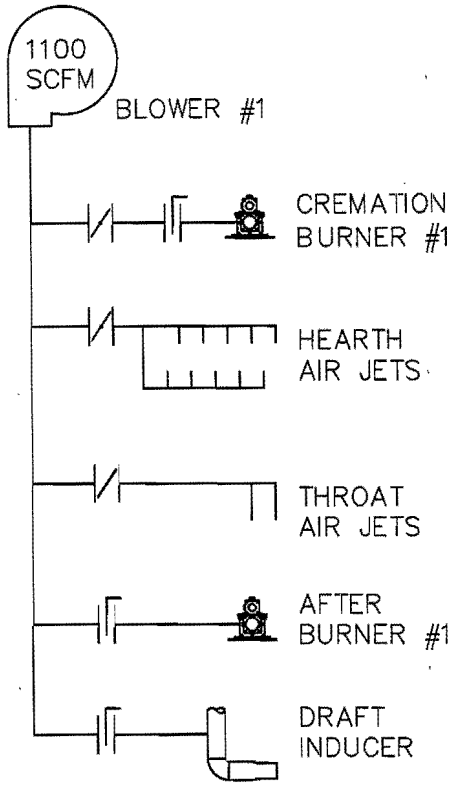
BUTTERFLY VALVE (ON/OFF)

FIXED BLADE BUTTERFLY DAMPER

FLOW DIAGRAM



AIR SCHEMATIC



Matthews CREMATION DIVISION
2045 Sprint Boulevard
Apopka, Florida 32703
USA

POWER PAK II PLUS

FLOW DIAGRAM & AIR SCHEMATIC

DATE:	03-10-12	SCALE:	1/4"=1'
DRAWN:	MT	PLOT SCALE:	1:48
APRVD:		SHEET:	1 OF: 1
DWG FILE:	PPII-PlusFlowDiaAirSchem		
DWG #:	0000523		

Calculation Of Emissions

Potential to Emit

Matthews Cremation Division (MCD)
(formerly Industrial Equipment and Engineering Company (IEE))
Crematory Incinerator Model IE43-PPII Plus

Total Incenerator Burn Capacity 175 lb/hr of remains (type 4) and associated containers (type 0)
Flue gas flow rate = 1175 dscfm 12 Hours/Day X 6 Days/Week X 52 Weeks/Year
(100 % Excess Air) = 3744 Hours/Year

Total Emission Rate = Incinerator Burn Rate X Emission Factor

Sulfer Dioxide (SO_2)

$$\frac{175 \text{ lb/hr} \times 2.5 \text{ lb/ton} \times 1 \text{ ton}}{2000 \text{ lbs}} = 0.219 \text{ lb/hr} = 0.4095 \text{ TPY}$$

$$\frac{0.21875 \text{ lb/hr} \times 4.54E{+}05 \text{ mg/lb} \times 1 \text{ ppmv}}{1175 \text{ dscfm} \times 60 \text{ min/hr} \times 0.0283 \text{ m}^3/\text{f}^3 \times 2.61 \text{ mg/m}^3} = 19.07 \text{ ppmv}$$

Nitrogen Oxide (NOx - as Nitrogen Dioxide)

$$\frac{175 \text{ lb/hr} \times 3 \text{ lb/ton} \times 1 \text{ ton}}{2000 \text{ lbs}} = 0.2625 \text{ lb/hr} = 0.4914 \text{ TPY}$$

$$\frac{0.2625 \text{ lb/hr} \times 4.54E{+}05 \text{ mg/lb} \times 1 \text{ ppmv}}{1175 \text{ dscfm} \times 60 \text{ min/hr} \times 0.028 \text{ m}^3/\text{f}^3 \times 1.88 \text{ mg/m}^3} = 32.11 \text{ ppmv}$$

Hydrocarbons (TOC/VOC - methane)

$$\frac{175 \text{ lb/hr} \times 3 \text{ lb/ton} \times 1 \text{ ton}}{2000 \text{ lbs}} = 0.2625 \text{ lb/hr} = 0.4914 \text{ TPY}$$

$$\frac{0.2625 \text{ lb/hr} \times 4.54E{+}05 \text{ mg/lb} \times 1 \text{ ppmv}}{1175 \text{ dscfm} \times 60 \text{ min/hr} \times 0.0283 \text{ m}^3/\text{f}^3 \times 0.65 \text{ mg/m}^3} = 91.90 \text{ ppmv}$$

Lead (Pb) (6.62E-05 lbs/cremation)

$$\frac{175 \text{ lb/hr} \times 0.0000662 \text{ lb Pb}}{100 \text{ lb}} = 0.0001 \text{ lb/hr} = 0.0002 \text{ TPY}$$

Particulates (PM & PM_{10}) (Actual Levels lower as shown by test results)

$$\frac{175 \text{ lb/hr} \times 7 \text{ lb/ton} \times 1 \text{ ton}}{2000 \text{ lbs}} = 0.6125 \text{ lb/hr} = 1.1466 \text{ TPY}$$

$$\frac{0.6125 \text{ lb/hr} \times 7.00E{+}03 \text{ gr/lb}}{1175 \text{ dscfm} \times 60 \text{ min/hr}} = 0.06 \text{ gr/dscf}$$

Carbon Monoxide (CO) (Actual Levels lower as shown by test results)

$$\frac{175 \text{ lb/hr} \times 10 \text{ lb/ton} \times 1 \text{ ton}}{2000 \text{ lbs}} = 0.875 \text{ lb/hr} = 1.638 \text{ TPY}$$

$$\frac{0.875 \text{ lb/hr} \times 4.54E{+}05 \text{ mg/lb} \times 1 \text{ ppmv}}{1175 \text{ dscfm} \times 60 \text{ min/hr} \times 0.028 \text{ m}^3/\text{f}^3 \times 1.14 \text{ mg/m}^3} = 176.53 \text{ ppmv}$$

Notes:
1. Incinerator Emissions based on EPA emissions from Table 2.1-12 of AP-42 (5th Edition)
2. All conversion factors from AP-42 Appendix A.

CREMATOR MASS BALANCE

Matthews Cremation

PPII Plus

THESE CALCULATIONS HAVE BEEN PREPARED TO EVALUATE THE COMBUSTION PROCESS IN THIS UNIT.

THE INCINERATOR INSTITUTE OF AMERICA HAS PUBLISHED THE FOLLOWING SPECIFICATIONS COVERING AVERAGE WASTES.

WASTE TYPE	TYPE 0	TYPE 4
BTU PER POUND	8500	1000
POUND ASH PER POUND WASTE	0.05	0.05
POUND MOISTURE PER POUND WASTE	0.1	0.85
POUND COMBUSTIBLES PER POUND WASTE	0.85	0.1
HOURLY CONSUMPTION OF WASTE (LBS)	10	165

1. MASS OF PRODUCTS OF COMBUSTION FROM CONTAINER

A. COMBUSTION AIR

$$\frac{8500 \text{ BTU/LB}}{100 \text{ BTU/CF OF AIR*}} \times 0.075 \text{ LB/CF OF AIR} = 6.38 \text{ LB/LB BURNED}$$

B. COMBUSTIBLES AND WATER VAPOR FROM CHART ABOVE = 0.95 LB/LB BURNED

C. TOTAL FLUE PRODUCT MASS PER LB BURNED = 7.33 LB/LB BURNED

2. MASS OF PRODUCTS OF COMBUSTION FROM BODY

A. COMBUSTION AIR

$$\frac{1000 \text{ BTU/LB}}{100 \text{ BTU/CF OF AIR*}} \times 0.075 \text{ LB/CF OF AIR} = 0.75 \text{ LB/LB BURNED}$$

B. COMBUSTIBLES AND WATER VAPOR FROM CHART ABOVE = 0.95 LB/LB BURNED

C. TOTAL FLUE PRODUCT MASS PER LB BURNED = 1.70 LB/LB BURNED

SPECIFICATIONS	
PRIMARY BURNER FUEL CONSUMPTION (MMBTU/HR)	0.5
SECONDARY BURNER FUEL CONSUMPTION (MMBTU/HR)	0.9
ADDITIONAL SECONDARY AIR SUPPLIED (CFM)	200
SEC. CHAMBER OPERATING TEMPERATURE (°F)	1600
SECONDARY CHAMBER VOLUME (CU. FT)	96
SEC. CHAMB. CROSS-SECTIONAL AREA (SQ. FT)	2.76
FLAME PORT AREA (SQ. FT)	2.95
MIXING BAFFLES AREA (SQ. FT)	1.36

*AIR AT STANDARD CONDITIONS

3. TOTAL FLUE PRODUCTS

A. MAXIMUM PRIMARY BURNER GAS USAGE

500000 BTU/HR x 4.8E-05 LBS/BTU = 24 LBS/HR

B. COMBUSTION AIR FOR PRIMARY BURNER

$$\frac{500000 \text{ BTU/HR}}{100 \text{ BTU/CF AIR}} \times \frac{1}{\text{Burner}} \times 0.075 \text{ LB/CF AIR} = 375 \text{ LBS/HR}$$

C. MAXIMUM SECONDARY BURNER GAS USAGE

900000 BTU/HR x 4.8E-05 LBS/BTU = 43 LBS/HOUR

D. COMBUSTION AIR FOR SECONDARY BURNER

$$\frac{900000 \text{ BTU/HR}}{100 \text{ BTU/CF AIR}} \times \frac{1}{\text{Burner}} \times 0.075 \text{ LB/CF AIR} = 675 \text{ LBS/HOUR}$$

E. PRODUCTS FROM TYPE 0 WASTE (CONTAINER)

7.33 LBS/LB BURNED x 10 LB/HR BURN RATE = 73 LBS/HOUR

F. PRODUCTS FROM TYPE 4 WASTE (TISSUE)

1.70 LBS/LB WASTE x 165 LB/HR BURN RATE = 281 LBS/HOUR

G. ADDITIONAL SECONDARY CHAMBER COMBUSTION AIR (THROAT AIR)

12000 CF/HR* x 0.075 LB/CF AIR = 900 LBS/HOUR

H. TOTAL FLUE PRODUCTS = 2371 LBS/HOUR

2. VELOCITY AND TIME CALCULATIONS

A. SCFM CALCULATION (PRODUCTS ASSUMED TO HAVE DENSITY CLOSE TO AIR)

$$2371 \text{ LBS/HR} \times \frac{13.35 \text{ STD. CU. FT/LB}}{60 \text{ MIN/HR}} = 528 \text{ SCFM}$$

B. TOTAL PRODUCTS ACFM @ 1600 °F

$$\frac{2060 \text{ °RANKINE}}{530 \text{ °RANKINE}} \times 527.5 \text{ CFM} = 2050 \text{ ACFM}$$

C. RETENTION TIME

$$\frac{96 \text{ CU. FT}}{2050 \text{ ACFM}} \times \frac{60 \text{ SECONDS}}{1 \text{ MINUTE}} = \mathbf{2.81 \text{ SECONDS}}$$