HUMAN CREMATORIES
AIR GENERAL PERMIT EXAMPLE REGISTRATION WORKSHEET

Facility Identification Number - If known (seven digit number)

_____

Registration Type 0710285-001

Check one:

INITIAL REGISTRATION - Notification of intent to:

- [x] Construct and operate a proposed new facility.
- [ ] Operate an existing permitted facility not currently using an air general permit (e.g., a facility proposing to go from an air operation permit to an air general permit). If the facility currently holds one or more air operation permits, such permit(s) must be surrendered by the owner or operator upon the effective date of this air general permit. (See "Surrender of Existing Air Operation Permit(s)" below.)
- [ ] Operates an existing facility not currently permitted or using an air general permit.

RE-REGISTRATION (for facilities currently using an air general permit) - Notification of intent to:

- [ ] Continue operating the facility after expiration of the current term of air general permit use.
- [ ] Continue operating the facility after a change of ownership.
- [ ] Make an equipment change requiring re-registration pursuant to Rule 62-210.310(2)(e), F.A.C.
- [ ] Any other change not considered an administrative correction under Rule 62-210.310(2)(d), F.A.C.

Surrender of Existing Air Operation Permit(s) - For Initial Registrations Only, if Applicable

All existing air operation permits for this facility are hereby surrendered upon the effective date of this air general permit; specifically permit number(s):

_____

General Facility Information

Facility Owner/Company Name (Name of corporation, agency, or individual owner who or which owns, leases, operates, controls, or supervises the facility.)
Mullins Memorial Funeral Home and Cremation Service, LLC

Site Name (Name, if any, of the facility site; e.g., Plant A, Metropolis Plant, etc. If more than one facility is owned, a complete registration must be submitted for each.)
Mullins Memorial Funeral Home and Cremation service, LLC

Facility Location (Physical location of the facility, not necessarily the mailing address.)
Street Address: 1056 NE 7th Terrace
City: Cape Coral County: Lee Zip Code: 33909

Facility Start-Up Date (Estimated start-up date of proposed **new** facility.)(N/A for existing facility.)
11-2012

Facility Contact

Name and Position Title (Plant manager or person to be contacted regarding day-to-day operations at the facility.)
Print Name and Title: Shannon Mullins

Facility Contact Telephone Numbers
Telephone: 239-242-0909 Fax: 855-242-0909
Cell phone: 239-357-8260
E-mail: Shannon@MullinsMemorial.com

Facility Contact Mailing Address
Organization/Firm: Mullins Memorial Funeral Home and Cremation Service, LLC
Mailing Address: 1056 NE 7th Terrace
City: Cape Coral County: Lee Zip Code: 33909

Correspondence Contact/Representative (to serve as additional Department contact)

Name and Position Title
Print Name and Title: Shannon Mullins Owner

Correspondence Contact/Representative Telephone Numbers
Telephone: 239-242-0909 Fax: 855-242-0909
Cell phone: 239-357-8260
E-mail: Shannon@MullinsMemorial.com

Correspondence Contact/Representative Mailing Address
Organization/Firm: _____
Mailing Address: _____
City: _____ County: _____ Zip Code: _____

Government Facility Code (check only one)

- [x] **Facility not owned or operated by a federal, state, or local government.**
- [ ] **Facility owned or operated by the federal government.**
- [ ] **Facility owned or operated by the state.**
- [ ] ***Facility owned or operated by the county.***
- [ ] **Facility owned or operated by the municipality.**
- [ ] **Facility owned or operated by a water management district.**

Emission Unit Details

MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	RATED CAPACITY
Crematory Manufacturing & Service	Millennium III	5201	150 lb/hr

Design Calculations

If this is an initial registration for a proposed new human crematory unit, provide design calculations to confirm a sufficient volume in the secondary chamber combustion zone to provide for at least a 1.0 second gas residence time at 1800 degrees F.

☒ Design calculations attached.

☐ Registration is not for proposed new human crematory unit(s).

Helpful Definitions

"Biomedical Waste" - Any solid or liquid waste which may present a threat of infection to humans, including nonliquid-tissue, body parts, blood, blood products, and body fluids from humans and other primates; laboratory and veterinary wastes which contain human disease-causing agents; and discarded sharps. The following are also included:
1. Used absorbent materials saturated with blood, blood products, body fluids, or excretions or secretions contaminated with visible blood; and absorbent materials saturated with blood or blood products that have dried.
2. Non-absorbent, disposable devices that have been contaminated with blood, body fluids, or secretions or excretions visibly contaminated with blood, but have not been treated by a method listed in Section 381.0098, F.S., or a method approved pursuant to Rule 64E-16, F.A.C.
"Department" or "DEP" - The State of Florida Department of Environmental Protection.
"Emissions Unit" - Any part or activity of a facility that emits or has the potential to emit any air pollutant.
"Facility" - All of the emissions units which are located on one or more contiguous or adjacent properties, and which are under the control of the same person (or persons under common control).
"Human Crematory" - Any combustion apparatus used solely for the cremation of either human or fetal remains
"Owner" or "Operator" - Any person or entity who or which owns, leases, operates, controls or supervises an emissions unit or facility.

CALCULATION SUMMARY
FOR MILLENIUM III CREMATORY COMBUSTION

CHARGE DATA, AVERAGE PER CREMATION

Body:	150 lbs - Gross Weight, 60% water $C_5H_{10}O_3$ –8, 800 BTU/lb Mol. Wt. – 118
Casket:	50 lbs – Gross Weight, 10% water $C_6H_{10}O_5$ – 8,000 BTU/lb Mol. Wt. – 162
Cycle Duration:	2 Hours

ESTIMATED RETORT DIMENSION

Primary Chamber:	9'-2" long 3'-0" wide 3'-4" high
Volume:	91.7 cu. ft.
Flame Port:	1'-0" high 1'-8.5" wide 3'-0" long
Volume:	5.125 cu.ft.
Stacked:	1'-8" dim 1'-8" high
Volume:	.799 cu.ft.
Mixing Chamber: (below burner)	3'-0" long 1'-8.5" wide 4'-0" high
Volume:	20.5 cu. ft.
Settling Chamber:	3'-0" long 1'-10.5" wide 5'-0" high
Volume:	28.125 cu. ft.

COMBUSTION SYSTEM

Afterburner:	Eclipse Thermjet, turbulent mixing, excess air burner set to yield; 1,000,000 BTU/h – High Fire 100,000 BTU/h – Low Fire Fully proportional modulation of fuel flow Constant airflow of 12,000 CFH
Main Burner:	Eclipse Thermjet Burner, firing on-ratio, set to yield; 400,000 BTU/h – High Fire 50,000 BTU/h – Low Fire High/Low firing control
Combustion Air:	North American Blower, to deliver; 12,000 CFH through Afterburner 500 to 4,000 CFH through Main Burner 8,000 CFH through Primary Air Ports 1,500 CFH through Flame Port Injector

Projected operating schedule is based on an average of two cremations per day, at 1-1/2 hours per cremation; plus time for preheating the secondary chamber and cool-down after each cremation. This yields two hours per cremation.

Nominal operating temperature in the primary chamber is 800°F. Maximum primary temperature may reach 1200°F under some conditions, depending on controller's setpoint and characteristics of charge. The purpose of the Main Burner is to ignite the case at the proper time and complete the cremation process.

Normal operating temperature of the afterburner is 1600°F. An auxiliary relay output in the Afterburner Temperature Controller prevents ignition of the Main Burner until the 1600°F setpoint is attained in the secondary chamber (at base of stack).

STARTUP ADJUSTMENTS

Main Chamber Draft:	0.10" w.c.
Main Air Ports:	Pressure to yield 8,000 CFH
Flame Port Air:	Pressure to yield 1,500 CFH

CALCULATION DATA

Initial Temperature of Charge:	70°F
Air Supplied to System:	70°F
Molecular Weight of 28.8:	20% O_2, 80% N_2
Volume of 1 lb-mole of any gas at 70°F:	390 cu. ft.

Assume combustion air is dry (normal moisture content of ambient air yields less than 1% error in combustion calculations).

Latent Heat of Water:	960 BTU/lb

Specific Heats of Fine Products, from 70°F to 1600°F:

CO_2	0.27 BTU/lb - °F
H_2O	0.50 BTU/lb - °F
N_2	0.26 BTU/lb - °F
O_2	0.24 BTU/lb - °F

For calculations, values 0.50 were used for water, and 0.26 for remaining products.

HOURLY COMBUSTION RATE

Based on a 1-1/2 hour actual cremation period, excluding preheat of secondary chamber and cool-down;

$\frac{150 \text{ lb}}{1.5 \text{ h}}$ – 100 lb/h

100 x .4 –40 lb/h – dry tissue

100 x .6 –60 lb/h –w ater

$\frac{50 \text{ lb}}{1.5 \text{ h}}$ – 33.3 lb/h – wood

33.3 x 9 –30 lb/h – dry wood

33.3 x 1 –3.3 lb/h – water

Tissue: $C_5H_{10}O_3 + 6O_2 - 5O_2 + 5H_2O$

$118 + 192 - 220 + 90$ Mol. Wt.

$10 + 65.1 - 74.6 + 30.5$ lbs

0.34 lb – moles

Wood: $C_6H_{10}O_5 + 6O_2 - 6CO_2 + 5H_2O$

$162 + 192 - 264 + 90$ Mol. Wt.

$30 + 35.5 - 48.9 + 16.6$ lbs

0.185 lb moles

Primary combustion air required: O_2 required = 65.1 + 35.5 = 100.6 lb/h

Dry Air Req'd = $\frac{100.6}{0.2}$ = 503 lb/h

Air supplied to the primary chamber through the air ports is 8,000 CFH. This air supply controls the primary rate of combustion:

$\frac{8,000}{390} \times 28.8 = 591$ lb/h

MAIN BURNER

The main burner fires on ratio at either low or high fire

$CH_4 + 2O_2 = CO_2 + 2H_2O$

$16 + 64 = 44 + 36$ Mol. Wt.

Low Fire: $2 + 8.2 = 5.6 + 4.6$ lbs

0.13 lb moles

High Fire: $16.4 + 65.6 = 45.1 + 36.9$ lbs

1.03 lb moles

Air Supplied equals: $\frac{8.2}{0.2}$ 41 lb/h @ Low Fire

$\frac{65.6}{0.2}$ 328 lb/h @ High Fire

An additional 1500 CFH of air is supplied to these combustion products as they approach the flame port.

This equals:

$$\frac{1600}{390} \times 28.8 = 111 \text{ lb/hr}$$

PRIMARY CHAMBER EXCESS AIR

Total Air Supply:	@ Low Fire:	591 + 41 + 111 = 743 lb/hr
	@ High Fire:	591 + 328 + 111 = 1030 lb/hr
Total Air Consumed:	@ Low Fire:	503 + 41 = 544 lb/hr
	@ High Fire:	503 + 328 = 831 lb/hr
Primary Air Ratio:	@ Low Fire:	$\frac{743}{544} = 136.6\%$
	@ High Fire:	$\frac{1030}{831} = 124.0\%$

Yields 24 to 36.6% Excess Air

Hence the Combustion Products exiting the Main Chamber include:

Main Burner at:	Low Fire	High Fire
N_2 lb/h	594.4	824
O_2 lb/h	38.8	38.8
CO_2 lb/h	129.1	168.6
H_2O lb/h	115	147.3
	877.3	1,178.7

The Gross Heat Release Equals:

Tissue: 40 x 8,800	352,000	352,000
Wood: 30 x 8,000	240,000	240,000
Natural Gas:	50,000	400,000
	642,000	992,000

Less Latent Heat of:		
Water at 960 BTU/lb	110,400	141,400
Net Heat Release	531,600	850,600

THEORETICAL TEMPERATURE AT FLAME PORT

Assume 25% of heat release if lost to or through the refractory lining of the Primary Chamber (primarily storage).

Temp. Rise x Specific Heat x Mass Flow – Available Heat x 75%

Low Fire:	(T-70)(115 x 0.5 + 762.3 x 0.26) – 531,600 x 0.75 T	1629°F
High Fire:	(T-70)(147.3 x 5 + 1031.4 x 0.26) = 850,600 x 0.75 T	1936°F

The combustion products pass from the primary chamber, through the flame port to be heated by and mixed with the products of combustion of the afterburner.

Total flow through the flame port with Main Burner at high fire (worst case) equals:

$$390 + \frac{824}{28} + \frac{38.8}{32} + \frac{168.6}{44} + \frac{147.3}{18} = 16{,}636 \text{ SCFH}$$

SECONDARY CHAMBER AND BURNER

The secondary burner is designed to fire as an "excess air" burner. A constant flow of air and variable flow of fuel are supplied to the burner. Fuel flow varies to maintain 1600°F at the top of the first stack section.

Excess air is provided to complete the combustion of any partially combusted products exiting the main chamber.

The burner injects a constant volume of air into the stream of primary combustion products. Airflow is 10,000 CFH. Fuel flow varies from 100,000 to 1,000,000 Btu/h.

The maximum firing rate is only required to preheat the secondary chamber. Once the charge is ignited and the Main Burner is operating, the afterburner modulates in the 300,000 to 400,000 BTU/h range. Using 400,000 BTU/h.

$$CH_4 + 2O_2 = CO_2 + 2H_2O$$

16 + 64 = 44 + 36 Mol. Wt.

16.4 + 65.6 = 45.1 + 36.9 lbs

Total Air Supplied equals: $\frac{10{,}000}{390} \times 28.8 = 738.5$ lb/h

containing 147.7 lb/h – O_2 and 590 lb/h – N_2

Hence the Burner Injects:

N_2 lb/h:	590.8
O_2 lb/h:	82.1
CO_2 lb/h	45.1
H_2O lb/h	36.9

Those gases yield a volumetric flow rate of:

$$390\ \frac{590.8}{28} + \frac{82.1}{32} + \frac{45.1}{44} + \frac{36.9}{18} = 10{,}429 \text{ SCFH}$$

Adding this to the flow through the flame port yields:

8,000+1,500+16,636 + 10,429 = 36,565 SCFM

or 599 SCFM

or 9.99 SCFS

At 1600°F, the volumetric flow ratio equals:

$$9.99\ \frac{2060}{530} = 38.8 \text{ cu. ft./sec}$$

The residence chamber volume is made 49.42 cu. ft.

Residence Time: $\frac{49.42 \text{ cu. ft.}}{38.8 \text{ cu. ft./sec.}}$

1.27 seconds

SYSTEM EXCESS AIR

Based on Main Burner at High Fire:

Total Air Supply: 1030 + 738.5 = 1768.5 lb/h

Total Air Consumed: 831 + 328 = 1159 lb/h

Primary Air Ratio: $\frac{1768.5}{1159} = 153\%$

Excess Air Equals 53%

YEARLY EMISSION CALCULATIONS

Number of crematioms per year	200 ea.
Run time per cremation	2 hrs.
Average weight of cremation	150 lb.
Number of units	1 ea.
Hours run a year	400 hrs.
Hours run a year per unit	400 hrs.
Pounds cremated per year	30000 lb.
Tons cremated per year	15 ton
Hours per day avg.	1.10 hrs.

Polluant	EF	EF Units	lb/yr	Tons/year
CO	0	lb/hr	0	0
NOX	0.32	lb/hr	128	0.064
PM-10	0.09	lb/hr	36	0.018
SOX	0.06	lb/hr	24	0.012
VOC	0.06	lb/hr	24	0.012
Lead	0	lb/hr	0	0
Total	0.53		212	0.106

ENGINEERING EVALUATION TEST
PM, NOx, CO, SO_2, NMHC & HCl
Millennium III, SN: 103

CREMATORY MANUFACTURING AND SERVICES, INC.
Tulsa, Oklahoma
Creek County
January 6, 2010

CETCON

ENGINEERING EVALUATION TEST

PM, NOx, CO, SO2, NMHC & HCl

Reference Methods: 1, 2, 3A, 4, 5, 6C, 7E, 10, 25A & 26A

Millennium III, SN: 103

Crematory Manufacturing and Services, Inc.

Tulsa, Oklahoma

Creek County

Test Date:
January 6, 2010

Report Date: January 14, 2010
CETCON Job Number: CJ-5858

" We certify that we have personally examined and we are familiar with the information submitted herein, and based on our inquiries of those individuals immediately responsible for obtaining the information, we believe the submitted information is true, accurate, and complete."

Gerald L. McCloskey
Sr. Project Coordinator

J. Jeff Abel
Project Coordinator

Michael T. Hanlon
Environmental Specialist

CETCON

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EXECUTIVE SUMMARY

A series of Engineering Evaluation Tests were performed for Crematory Manufacturing and Services, Inc. on the Millennium III cremator stack, Serial Number 103, located in Tulsa, Oklahoma on January 6, 2010. Testing was performed to document mass emission rates of nitrogen oxides (NO_x), carbon monoxide (CO), sulfur dioxide (SO_2), non-methane hydrocarbons (NMHC), hydrogen chloride (HCl), and particulate matter (PM). A series of three 64-minute test runs (labeled E1, E2, and E3) were conducted. Testing was conducted, according to guidelines and procedures outlined in the Code of Federal Regulations (CFR) Title 40, Part 60, Appendix A, Methods 1, 2, 3A, 4, 5, 6C, 7E, 10, 25A, & 26A, .

The average results were as follows:

Parameter	**ppmvd**	**lb/hr**
PM	NA	0.09
HCl	8.23	0.03
NO_x	64.95	0.32
CO	0.02	0.00
SO_2	8.86	0.06
NMHC	12.04	0.06

Parameter	**Concentration Corrected to 7.0% O_2**
CO	0.03 ppmvd
PM	0.02 gr/dscf

A complete breakdown of all test data can be found on the following page of this report titled, "Summary of Results".

CETCON

CETCON, Inc.

SUMMARY OF RESULTS

Unit Designation: CMS, Inc.
Tulsa, Oklahoma
Millennium III SN: 103

PARAMETERS:

Test No.	E1	E2	E3	
Date	1/6/2010	1/6/2010	1/6/2010	
Start Time	1338	1721	1958	
End Time:	1457	1837	2113	
Test Duration (min.)	64	64	64	
OPERATING DATA:				**Average:**
Approx. Body weight:	160	130	160	150
FLUE GAS:				
Stack Temperature, °F	1540	1505	1555	1533
O_2, % dry	11.27	11.13	12.04	11.48
CO_2, % dry	5.97	6.13	5.24	5.78
CO, % dry	0.00	0.00	0.00	0.00
N_2, %dry	82.76	82.75	82.71	82.74
% Moisture	9.87	10.38	10.25	10.17
Stack Flow, ACFM	2988	2828	2999	2938
Stack Flow, DSCFM	699	668	694	687
% Isokinetic (1)	95.4	102.7	98.8	99.0
EMISSION DATA:				
Front Half PM, lb/dscf ($x10^{-6}$)	2.27	2.51	1.96	2.25
Front Half PM, lb/hr	0.10	0.10	0.08	0.09
Front Half PM, gr/dscf @ 7.0% O_2 (2)	0.02	0.03	0.02	0.02
HCl, ppmvd	8.32	8.21	8.15	8.23
HCl, lb/hr	0.03	0.03	0.03	0.03
NO_x, ppmd	59.04	60.39	75.42	64.95
NO_x, lb/hr	0.30	0.29	0.37	0.32
CO, ppmd	0.00	0.07	0.00	0.02
CO, lb/hr	0.00	0.00	0.00	0.00
CO, ppmvd corr. @ 7.0% O_2	0.00	0.10	0.00	0.03
SO_2, ppmd	9.28	5.47	11.83	8.86
SO_2, lb/hr	0.06	0.04	0.08	0.06
NMHC, ppmw	5.14	16.47	NA (3)	10.81
NMHC, ppmd	5.71	18.38	NA	12.04
NMHC, lb/hr (4)	0.03	0.08	NA	0.06

NOTES:

1. % Isokinetic Must Be 90≥ %I ≤110 Per RM-5
2. gr/dscf = lb/dscf x 7000 gr/lb
3. NMHC results for Test Run 3 were considered invalid due to a malfunction with CETCON's NMHC analyzer.
4. Non-Methane Hydrocarbons reported as propane eqivalent.

DATE 1/26/2010 SUMGAS.XLS

SAMPLING METHODS

Pollutants were measured according to EPA Reference Methods (RM's) described in the Code of Federal Regulations (CFR), Title 40, Chapter 1, Part 60, Appendix A. The following methods were used:

RM-1	Sample and velocity traverses for stationary sources. Determination of measurement site and sample point location.
RM-2	Determination of stack gas velocity and volumetric flow rate. A calibrated Type S pitot tube is used in conjunction with an inclined manometer to determine average gas velocity and for quantifying gas flow.
RM-3A	Determination of Oxygen (O_2) and Carbon Dioxide (CO_2) concentrations in emissions from stationary sources (Instrumental Analyzer Procedure). Servomex 1400B4 series analyzers are used to continuously measure the concentrations of O_2 and CO_2. O_2 and CO_2 concentrations are determined by paramagnetic and non-dispersive infrared detectors, respectively. The instruments are calibrated with gases prepared according to EPA Protocol One.
RM-4	Determination of moisture content in stack gases. A gas sample is extracted from the source through an impinger sampling train which condenses the moisture. The volume of the gas sample leaving the impinger train is determined using a calibrated dry gas meter. The impingers are weighed before and after the test run to determine moisture content.
RM-5	Determination of particulate emissions from stationary sources. Particulate matter is extracted isokinetically from the source and collected in a heated probe and heated glass fiber filter which are maintained at 248 ± 25 °F. An impinger train is used to remove the moisture and condensable particulate matter from the gas sample. Gas sample volume is determined using a calibrated dry gas meter. The mass of particulate matter is determined gravimetrically.
RM-6C	Determination of Sulfur Dioxide (SO_2) emissions from stationary sources (Instrumental Analyzer Procedure). A Bovar (Western Research) Model 721AT2 or 721M ultraviolet photometric analyzer is used to continuously measure the concentration of SO_2. The instrument is calibrated with gases prepared according to EPA Protocol One.

SAMPLING METHODS, continued

RM-7E — Determination of Nitrogen Oxides (NO_X) emissions from stationary sources (Instrumental Analyzer Procedure). A Thermo Environmental Instruments Company Model 10S, 42H or 42C chemiluminescent analyzer is used to continuously measure the concentration of NO_X. The instrument is calibrated with gases prepared according to EPA Protocol One.

RM-10 — Determination of Carbon Monoxide (CO) emissions from stationary sources (Instrumental Analyzer Procedure). A Thermo Environmental Instruments Company Model 48 or 48C gas filter correlation infrared analyzer is used to continuously measure the concentration of CO. The instrument is calibrated with gases prepared according to EPA Protocol One.

RM-25A — Determination of non-methane total gaseous organic concentration using a flame ionization analyzer (FIA). A gas sample is extracted from the source through a heated sample line and heated filter (if necessary). The instruments are calibrated with gases prepared according to EPA Protocol One consisting of Methane (CH4) or Propane (C3H8) in a balance of Nitrogen (N2) or air. NMHC concentrations are expressed in units of ppm as C3H8 or as Carbon.

RM-26A — Determination of Hydrogen Halide (HCl, HBr and HF) and Halogen (Cl_2 and Br_2) emissions from stationary sources - Isokinetic method. A gas sample is extracted isokinetically from the source through a heated glass probe and heated Teflon filter. The Hydrogen halides are absorbed in impingers containing 0.1N sulfuric acid (H_2SO_4). The Halogens, having low solubility in acidic solutions, pass through and are absorbed in impingers containing 0.1N sodium hydroxide (NaOH). Gas sample volume is determined using a calibrated dry gas meter. The collected samples are analyzed by Ion Chromatography. This method being isokinetic is used in place of RM-26 for sources with wet scrubbers where moisture droplets may be present.

DESCRIPTION OF TEST

Personnel from CETCON, (Combustion and Environmental Testing Consultants), arrived at Crematory Manufacturing and Services, Inc. (CMS) in Tulsa, Oklahoma on Tuesday, January 5, 2010 at 4:00 PM. The purpose of the visit was to perform a series of engineering evaluation tests on the Millennium III Cremator Stack for Particulate Matter (PM), Nitrogen Oxide (NO_x), Carbon Monoxide (CO), Sulfur Dioxide (SO_2), Non-Methane Hydrocarbons (NMHC) and Hydrogen Chloride (HCl).

The test trailer, identified as CETCON IV, was parked near the building that housed the cremator. Power was supplied to the trailer and testing equipment from various power receptacles in the area. Water, needed for cooling the particulate probe, was supplied by a standard water faucet located on the outside of the building. The test trailer and reference method analyzers were powered up and checked for proper operation. The remote testing equipment was lifted to the roof and assembled in preparation for testing to take place the following morning. The equipment and trailer were secured for the evening and CETCON departed the facility at approximately 7:00 PM.

CETCON returned to the facility on Wednesday, January 6, 2010 at 8:00 AM. Sample components for RM 5 particulate matter (PM) and HCl were hoisted and assembled on the stack while reference method (RM) analyzers were calibrated. Calibration error, calibration bias, and system response time tests were performed on the RM analyzers. The sample probe was traversed across the stack to obtain preliminary data needed for determining isokinetic sampling. It was discovered that the stack flow was much lower than expected. Maintenance was performed on the cremator's blower (dirty inlet screen) unit to correct air flow issues. Upon completion the first cadaver was inserted into the cremator. The RM sample probe was inserted into the stack and allowed to achieve a stable response. The PM and HCl probe was inserted into the stack and the first test run (labeled E1) was initiated at 1:38 PM. Each of the two sample ports were traversed for 32 minutes for a total test duration of 64 minutes. The PM and HCl train was positioned at each of sixteen sample traverse points for a duration of four minutes per point. Following the test run, a leak test was conducted on the PM and HCl train and a sample system bias test was performed on the RM analyzers to monitor analyzer drift. The PM and HCl samples were recovered while the cremator was prepared for the second cadaver.

The PM and HCl sample train was reassembled and leak checked. There was a delay because the probe was not heating correctly and the heated probe liner had to be replaced to correct the problem. Another leak check was performed and the probe was inserted into the stack. The second test run (labeled E2) was started at 5:21 PM and completed at 6:37 PM. It was identical in procedures to those described above. Again the PM and HCl samples were recovered and stored in the test trailer. Calibration drift tests were performed on the RM analyzers to document analyzer bias and drift. A third test run (labeled E3) was performed starting at 7:58 PM and concluding at 9:13 PM. It was identical in procedure and technique as runs E1 and E2.

As the third test run was initiated it was noticed that the concentration of NMHC exceeded the analyzer span. Further investigation revealed that the analyzer had apparently become contaminated. Due to the limited time of each run and since all of the other RM analyzers and PM samples were in progress it was decided to continue with the third test run. At the

DESCRIPTION OF TEST, continued

conclusion of the third test run air was pulled through the sample system to purge contaminates from the NMHC analyzer. Observation of the analyzer operation confirmed some type of contaminate was trapped in the sample column. Due to the contamination, the analyzer failed to meet the post run drift criteria. It was decided that two good NMHC runs would be sufficient data for the demonstration of NMHC emissions from the cremator.

This concluded the testing to be performed. Some of the test equipment was disassembled and lowered to grade, but because of sleet, freezing rain, and slippery conditions on the roof, it was decided to wait until the next day to finish breaking down the remaining equipment. The trailer was secured for the evening and CETCON personnel departed the plant at approximately 11:00 PM.

CETCON returned to the facility on Thursday, January 7, 2010 at 1:30 PM. The remaining testing equipment was secured in the trailer for departure and CETCON personnel left the facility at 3:30 PM.

The following people were present for all or part of the testing at Crematory Manufacturing Services facilities on Wednesday, January 6, 2010.

Shaun Seely	Crematory Manufacturing Services, Inc.
Jerry McCloskey	CETCON, Inc.
Jeff Abel	CETCON, Inc.
Mike Hanlon	CETCON, Inc.

HUMAN CREMATORIES
Air General Permit Example Registration Worksheet

The Department of Environmental Protection ("Department" or "DEP") has established an "air general permit" at Florida Administrative Code ("F.A.C.") Rule 62-210.310(5)(c) for human crematories. An air general permit is an authorization by rule to construct or operate a specific type of air pollutant emitting facility. Use of such authorization by any individual facility does not require action by the Department. The terms and conditions of the air general permit are set forth in the rule, rather than in a separately issued air construction or air operation permit.

If you are the owner or operator of an eligible facility comprising one or more human crematories, you may register to use the air general permit at Rule 62-210.310(5)(c), F.A.C., by following the general procedures given at subsections 62-210.310(2) and 62-210.310 (5), F.A.C. To register, use the Department's electronic registration system (currently under development) or submit all the information specified in the above rules to either of the following addresses, along with the air general permit registration processing fee ($100.00), payable to FDEP.

Regular USPS Mail Delivery
Department of Environmental Protection
Receipts
Post Office Box 3070
Tallahassee, Florida 32315-3070

or

Overnight Delivery (FedEx, UPS, DHL, etc.)
Department of Environmental Protection
3800 Commonwealth Blvd.
Mail Station 77
Tallahassee, Florida 32399

If you properly register to use an air general permit, and are not denied use of the air general permit by the Department, you are authorized to construct and operate the facility in accordance with the general terms and conditions of Rule 62-210.310, F.A.C., and the specific terms and conditions of Rule 62-210.310(5)(c), F.A.C. Your facility may vary, so be sure your registration describes the operations at your facility in sufficient detail to demonstrate the facility's eligibility for use of the air general permit and to provide a basis for tracking any future equipment or process changes. Your registration should describe all air pollutant-emitting processes and equipment at the facility, and it should identify any air pollution control measures or equipment used.

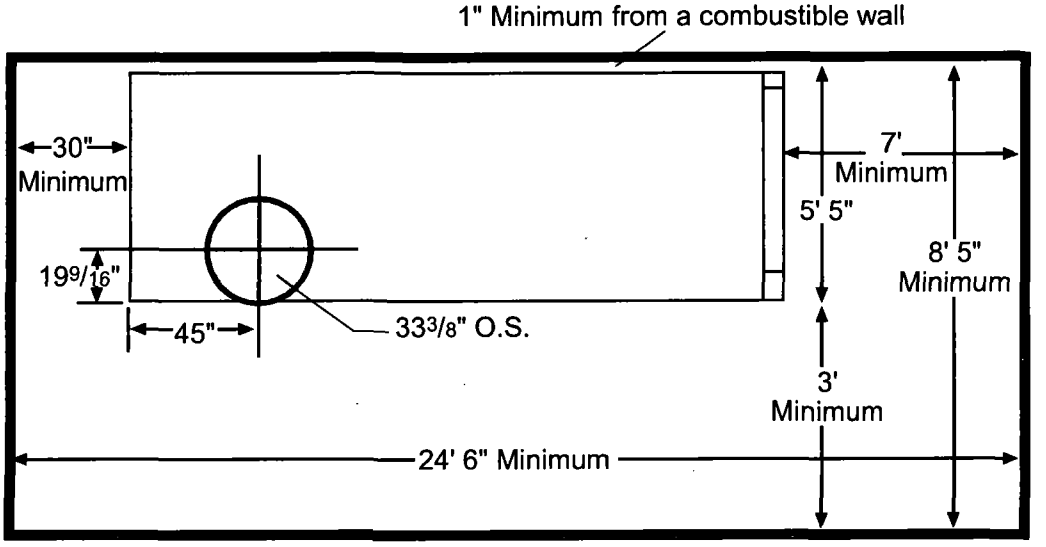
The rules do not require any specific format for the registration. This worksheet, however, has been designed to assist owners and operators. Using it as a template for a general permit registration will help ensure that all necessary information is submitted.

Additional information can be found on the Department's air general permit program website (http://www.floridadep.org/air/emission/air_gp.htm) or by calling the Small Business Environmental Assistance Program Hotline at 1-800-SBAP-HLP (1-800-722-7457).

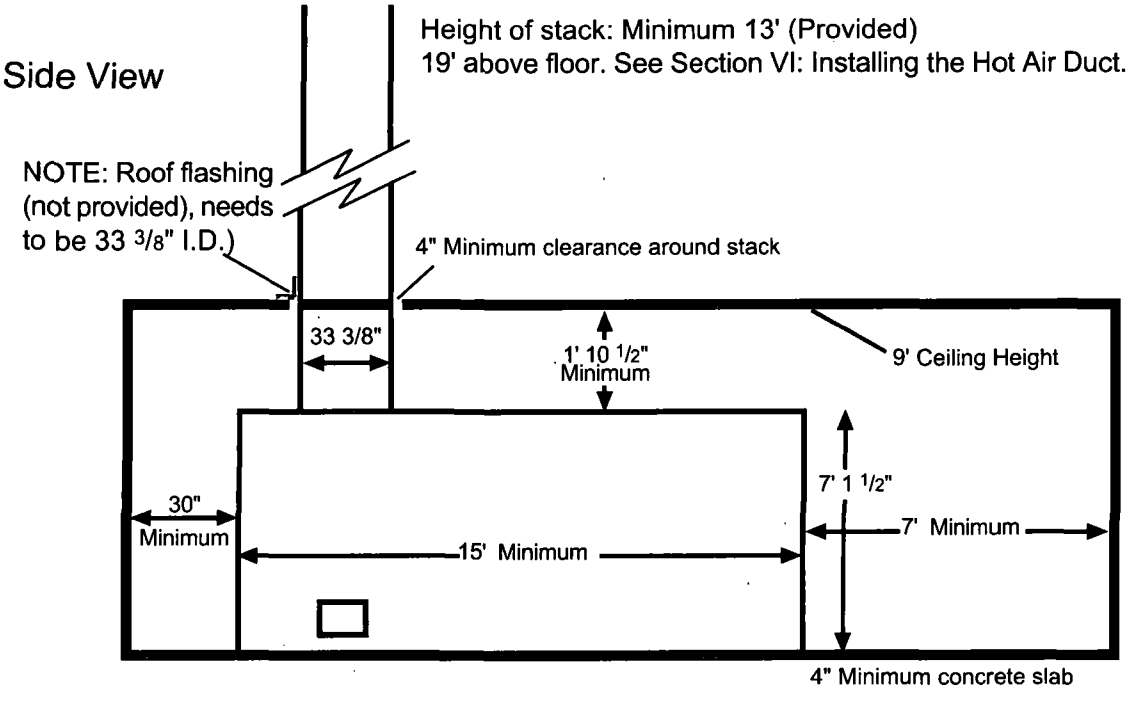
Drawing #S118

Floor Plan and Elevation

Top View



Side View

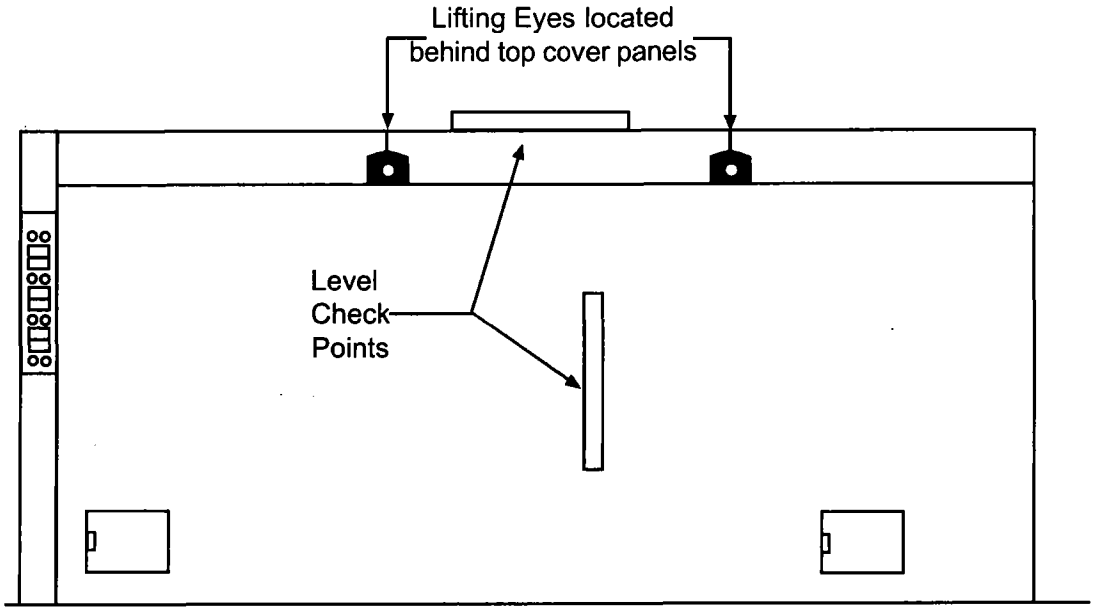


NOTES:
1. Room entrance must be a minimum of 6' wide and 8' high to accept unit.
2. Unit may be located any place within room as long as minimums are maintained.
3. Control panel may be on either left or right side whichever customer prefers. (3" side minimum is on control panel side.)

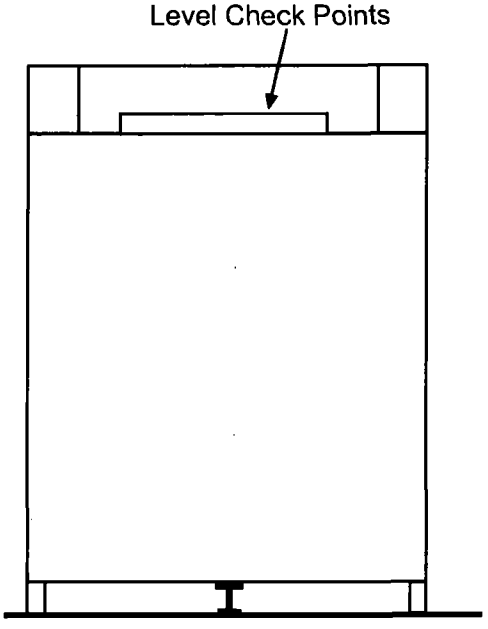
Drawing #S119

Level Check Points
Lifting Eye Locations

Side View



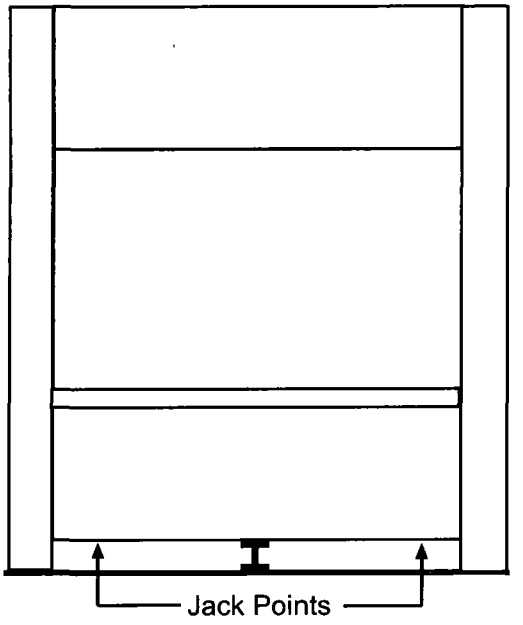
Rear View



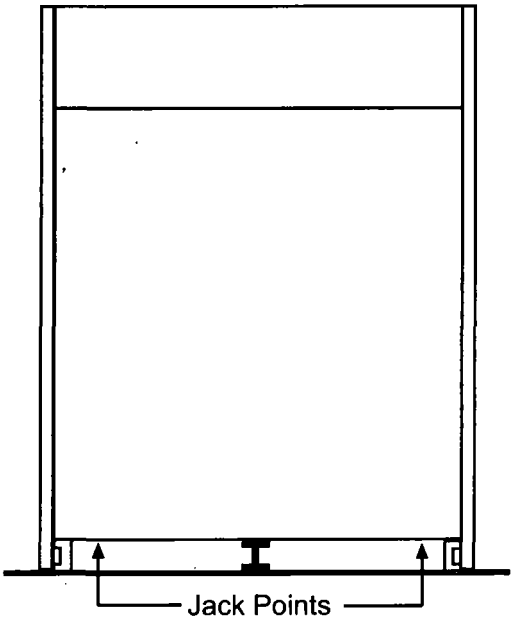
Drawing #S120

Jack Points

Front View

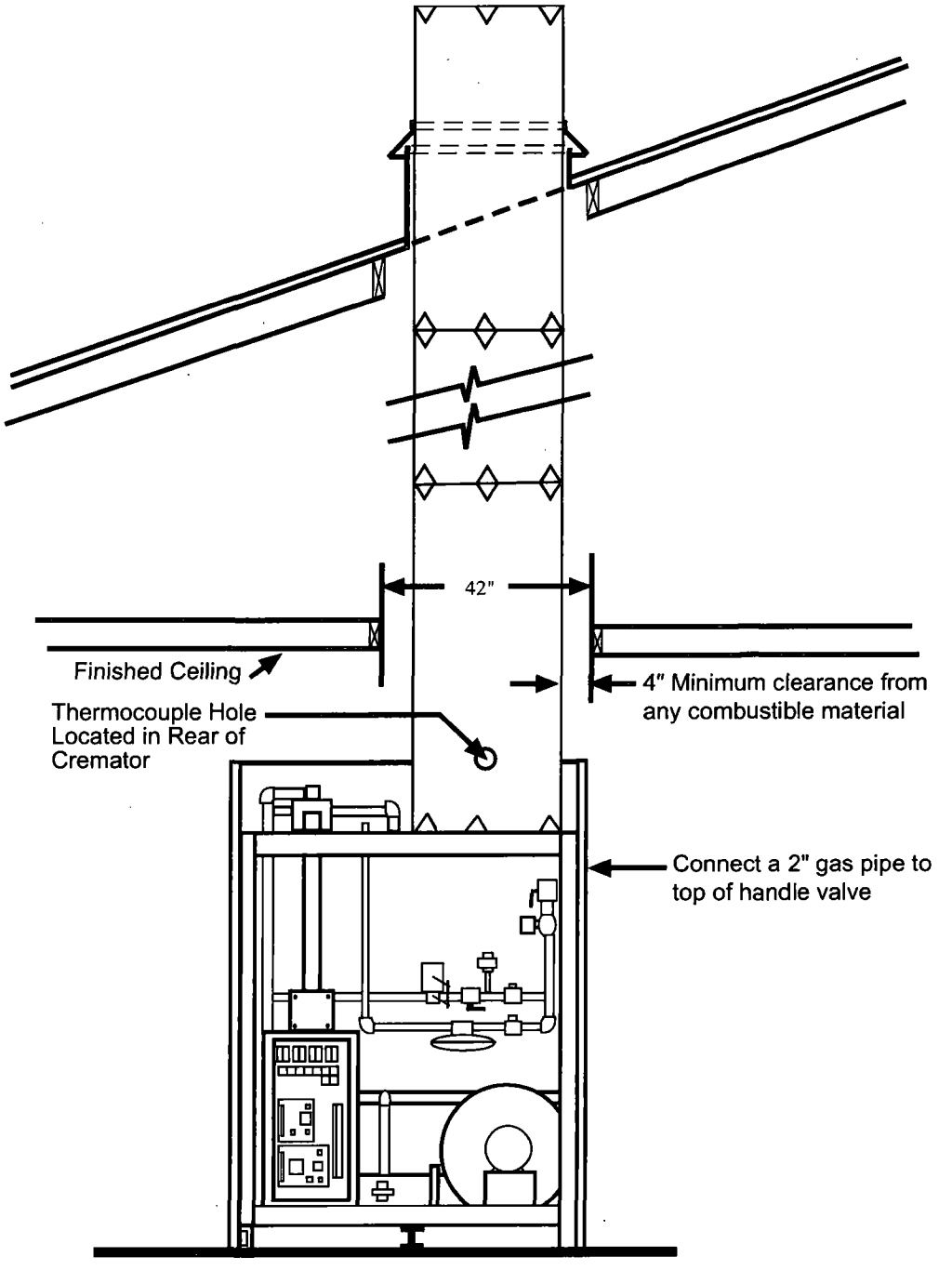


Rear View



Drawing #S121

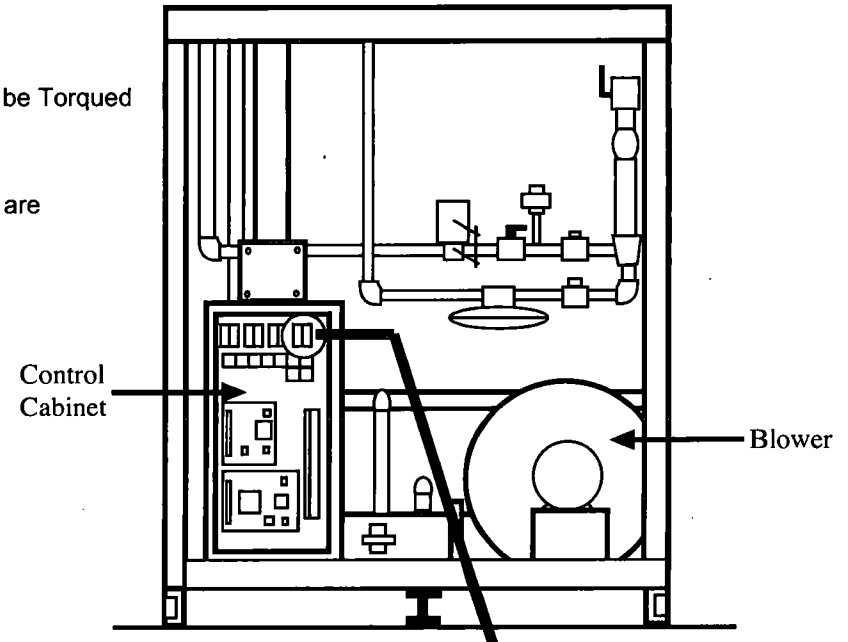
Hot Air Duct Installation
Fuel Connections



Drawing #S122 **Electrical Connections**

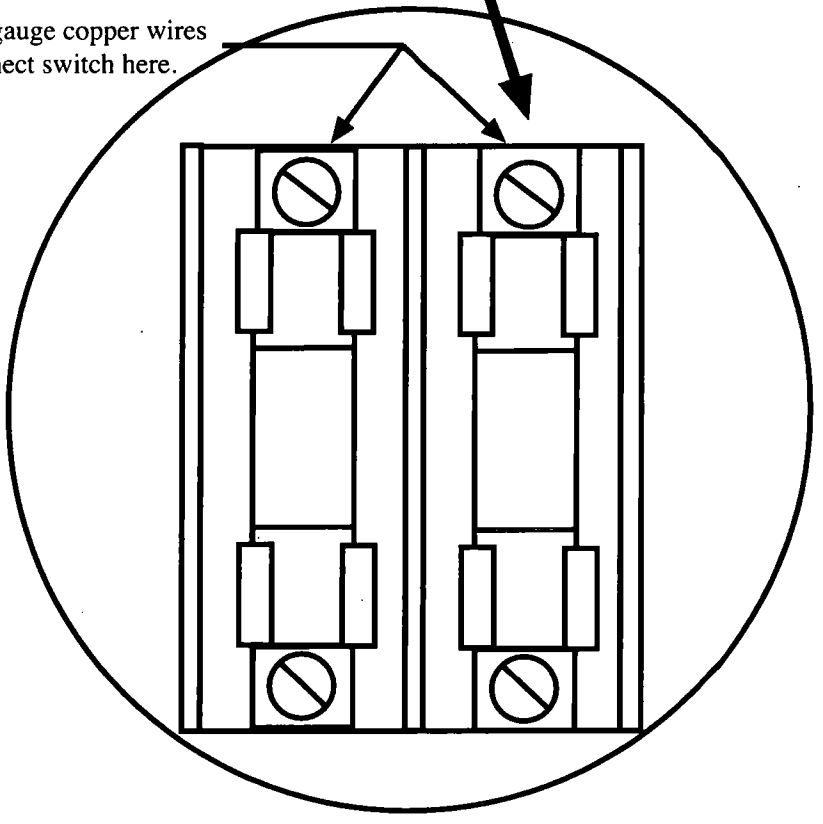
Copper Connectors to be Torqued at 35 in Pounds

Ground Torque Specs are 50 in Pounds



Electrical Connections

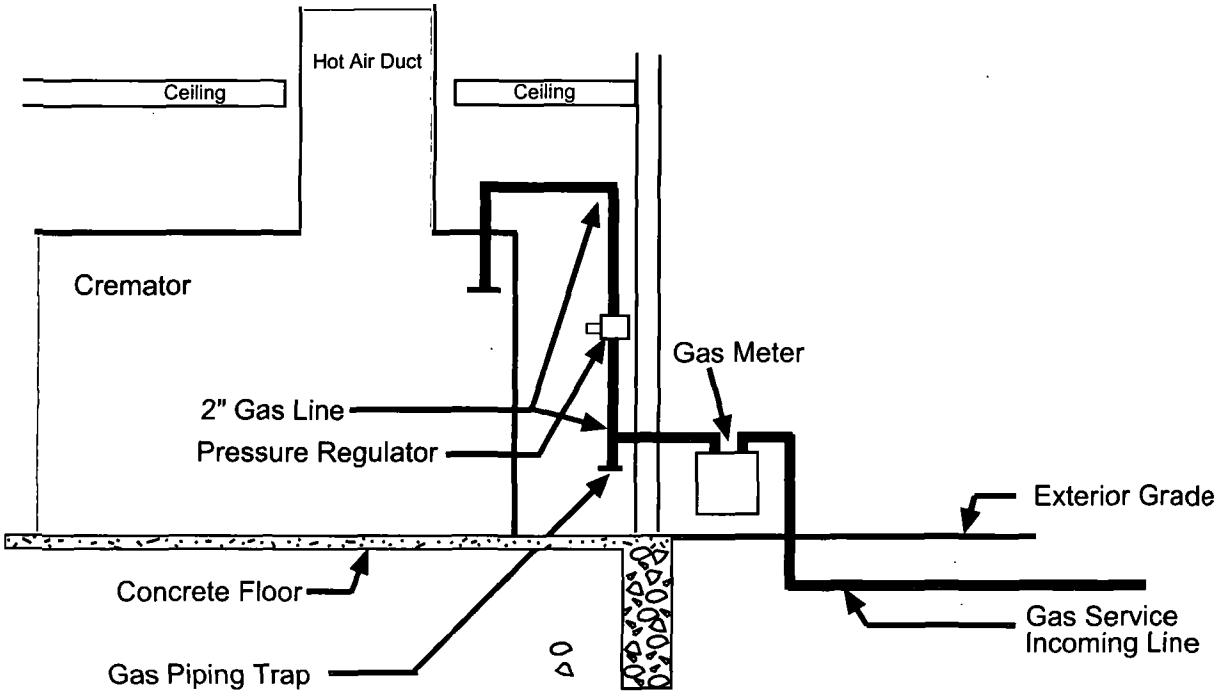
Connect #8 gauge copper wires from disconnect switch here.



Note: Cremator must be grounded per local codes and regulations.

Drawing #S123

Natural Gas Installation

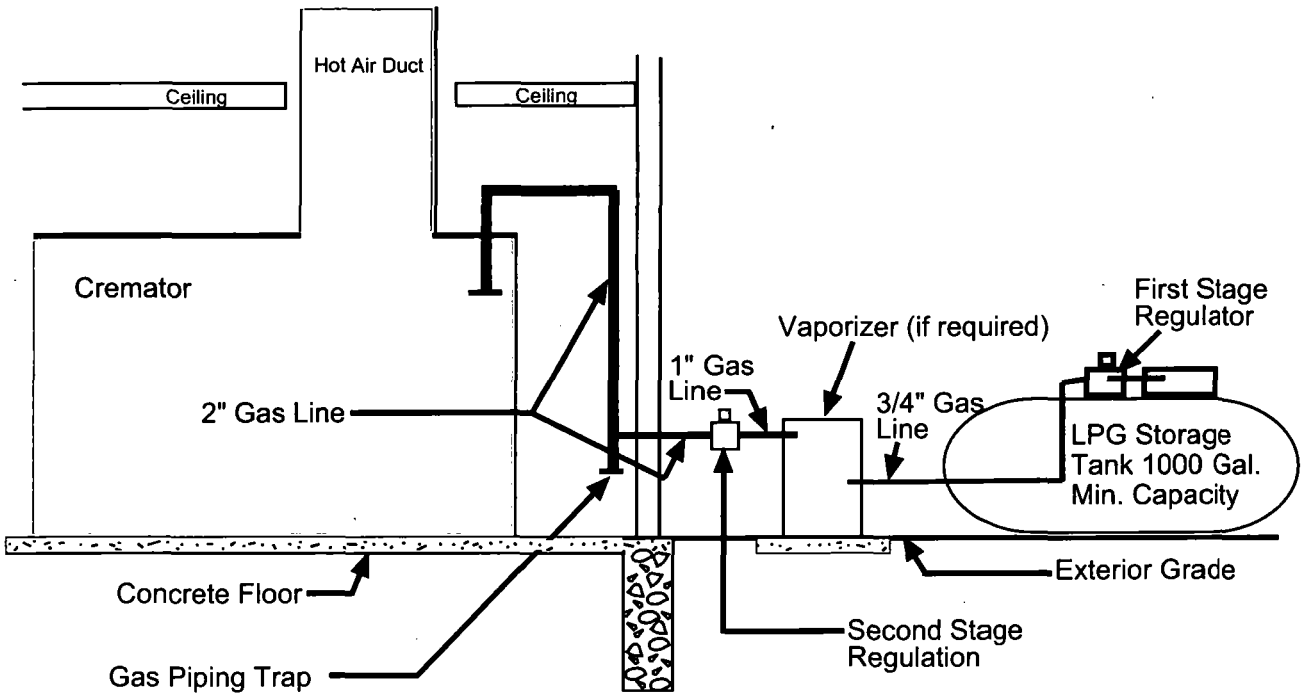


GENERAL NOTES:

1. Local codes and regulations must be followed.
2. A 2" gas line is required from gas meter to cremator.
3. Static gas pressure not to exceed 18" W.C.
4. Operating gas pressure is 12" to 14" W.C. flowing at 2116 CFH.
5. Required pressure regulator has a range of 6" to 28" W.C. with a 3/4" orifice.
6. Pressure regulator must be located close to rear of crematory.
7. A gas piping trap must be installed upstream of the gas supply connection to the cremator.

Drawing #S124

Propane (LPG) Installation



GENERAL NOTES:

1. Local codes and regulations must be followed.
2. LPG storage tank and vaporizer location will depend on local regulations.
3. LPG tank must have 1000-gallon capacity minimum (or two 500-gallon tanks).
4. Vaporizer required if temperature is below 40°F for extended periods of time.
5. Operating pressure must be 12" to 14" W.C. flowing at 2116 CFH.
6. Pressure not to exceed 18" W.C.
7. LPG tank may be located below ground. Vaporizer not required if tank is underground.
8. A 2" gas pipe required from second stage regulator.
9. A gas-piping trap must be installed up stream of the gas supply connection to the crematory.