City of Portland, Maine - Building or Use Permit Application

389 Congress Street, 04101 Tel: (207) 874-8703, Fax: (207) 874-8716

Permit No:	Issue Date:	CBL:
08-1386		176 A005001

Location of Construction:	Owner Name:	Owner Address:	Phone:
10 HILLIS ST	KOSTER ROY A	10 HILLIS ST	
Business Name:	**Contractor Name:**	**Contractor Address:**	**Phone**
	Caron & Waltz	321 Lincoln Street South Portland	2077992228
Lessee/Buyer's Name	**Phone:**	**Permit Type:**	**Zone:**
		HVAC	R5

Past Use:	Proposed Use:	Permit Fee:	Cost of Work:	CEO District:
Single Family Home	Single Family Home - install a Burnham MST396 Oil Boiler	$90.00	$6,965.00	3

FIRE DEPT: ☐ Approved ☐ Denied

Signature:

INSPECTION:
Use Group: R-3 Type: HVAC
IRC 2003
SFMI oil + Solid Fuel Bd

Signature: 10/30/08

Proposed Project Description:
install a Burnham MST396 Oil Boiler

PEDESTRIAN ACTIVITIES DISTRICT (P.A.D.)

Action: ☐ Approved ☐ Approved w/Conditions ☐ Denied

Signature: Date:

Permit Taken By:	Date Applied For:
ldobson	10/29/2008

1. This permit application does not preclude the Applicant(s) from meeting applicable State and Federal Rules.
2. Building permits do not include plumbing, septic or electrical work.
3. Building permits are void if work is not started within six (6) months of the date of issuance. False information may invalidate a building permit and stop all work..

PERMIT ISSUED
OCT 30
CITY OF PORTLAND

Zoning Approval

Special Zone or Reviews	Zoning Appeal	Historic Preservation
☐ Shoreland	☐ Variance	☑ Not in District or Landmark
☐ Wetland	☐ Miscellaneous	☑ Does Not Require Review
☐ Flood Zone OK	☐ Conditional Use	☐ Requires Review
☐ Subdivision	☐ Interpretation	☐ Approved
☐ Site Plan	☐ Approved	☐ Approved w/Conditions
Maj ☐ Minor ☐ MM ☐	☐ Denied	☐ Denied
Date: 10/30/08	Date:	Date: 10/30/08

CERTIFICATION

I hereby certify that I am the owner of record of the named property, or that the proposed work is authorized by the owner of record and that I have been authorized by the owner to make this application as his authorized agent and I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in the application is issued, I certify that the code official's authorized representative shall have the authority to enter all areas covered by such permit at any reasonable hour to enforce the provision of the code(s) applicable to such permit.

SIGNATURE OF APPLICANT | ADDRESS | DATE | PHONE

RESPONSIBLE PERSON IN CHARGE OF WORK, TITLE | DATE | PHONE

City of Portland, Maine - Building or Use Permit

389 Congress Street, 04101 Tel: (207) 874-8703, Fax: (207) 874-8716

Permit No:	Date Applied For:	CBL:
08-1386	10/29/2008	176 A005001

Location of Construction:	Owner Name:	Owner Address:	Phone:
10 HILLIS ST	KOSTER ROY A	10 HILLIS ST	
Business Name:	**Contractor Name:**	**Contractor Address:**	**Phone**
	Caron & Waltz	321 Lincoln Street South Portland	(207) 799-2228
Lessee/Buyer's Name	**Phone:**	**Permit Type:**	
		HVAC	

Proposed Use:	Proposed Project Description:
Single Family Home - install a Burnham MST396 Oil Boiler	install a Burnham MST396 Oil Boiler

Dept: Zoning **Status:** Approved with Conditions **Reviewer:** Tom Markley **Approval Date:** 10/30/2008

Note: **Ok to Issue:** ☑

1) This permit is being approved on the basis of plans submitted. Any deviations shall require a separate approval before starting that work.

Dept: Building **Status:** Approved with Conditions **Reviewer:** Tom Markley **Approval Date:** 10/30/2008

Note: **Ok to Issue:** ☑

1) This appliance shall be installed, operated and maintained per the manufacturers specifications
2) Installation shall comply with 2003 International Mechanical Code and State of Maine Oil and Solid Fuel Board Laws and Rules
3) Application approval based upon information provided by applicant. Any deviation from approved plans requires separate review and approrval prior to work.

176-A-005

FILL IN AND SIGN WITH INK

APPLICATION FOR PERMIT
HEATING OR POWER EQUIPMENT

To the INSPECTOR OF BUILDINGS, PORTLAND, ME.

The undersigned hereby applies for a permit to install the following heating, cooking or power equipment in accordance with the Laws of Maine, the Building Code of the City of Portland, and the following specifications:

Location / CBL 10 HILLIS STREET Use of Building RESIDENTIAL Date 10/28/08

Name and address of owner of appliance ROY FOSTER, 10 HILLIS STREET, PORTLAND, ME 04102

Installer's name and address CARON & WALTZ, 321 LINCOLN ST, SO. PORTLAND ME 04106

Telephone 799-2228

Location of appliance:

- [X] Basement
- [ ] Floor
- [ ] Attic
- [ ] Roof

Type of Fuel:

- [ ] Gas
- [X] Oil
- [ ] Solid

Appliance Name: BURNHAM MST396

U.L. Approved [ ] Yes [ ] No

Will appliance be installed in accordance with the manufacture's installation instructions? [X] Yes [ ] No

IF NO Explain:

The Type of License of Installer:

- [ ] Master Plumber #
- [ ] Solid Fuel #
- [X] Oil # MS 30665275
- [ ] Gas #
- [ ] Other

Type of Chimney:

- [X] Masonry Lined
  Factory built
- [ ] Metal
  Factory Built U.L. Listing #
- [ ] Direct Vent
  Type UL#

Type of Fuel Tank

OCT 29

- [X] Oil
- [ ] Gas

Size of Tank 275 GALLON Vertical tank

Number of Tanks 1

Distance from Tank to Center of Flame more than 5 **feet.**

Cost of Work: $ 6965

Permit Fee: $ 90—

Approved

Fire:

Ele.:

Bldg.:

Approved with Conditions

[ ] See attached letter or requirement

Inspector's Signature

Date Approved

Signature of Installer

White - Inspection Yellow - File Pink - Applicant's Gold - Assessor's Copy

INSTALLATION, OPERATING AND SERVICE INSTRUCTIONS FOR

MegaSteam™
3-PASS OIL BOILER

As an ENERGY STAR® Partner, Burnham Hydronics has determined that the MST288, MST396, MST513 and MST629 meet the ENERGY STAR® guidelines for Energy efficiency established by the United States Environmental Protection Agency (EPA).

For service or repairs to boiler, call your heating contractor or oil supplier. When seeking information on boiler, provide Boiler Model Number and Serial Number as shown on Rating Label located on top of the boiler.

Boiler Model Number	Boiler Serial Number	Installation Date
MST		
Heating Contractor		Phone Number
Address		

Burnham® Hydronics
U.S. Boiler Company, Inc.

100618-01R4-5/08

Price - $3.00

IMPORTANT INFORMATION - READ CAREFULLY

All boilers must be installed in accordance with National, State and Local Plumbing, Heating and Electrical Codes and the regulations of the serving utilities. These Codes and Regulations may differ from this instruction manual. Authorities having jurisdiction should be consulted before installations are made.
In all cases, reference should be made to the following Standards:

USA BOILERS

A. **Current Edition of American National Standard ANSI/NFPA 31, "Installation of Oil Burning Equipment", for recommended installation practices.**
B. **Current Edition of American National Standard ANSI/NFPA 211, "Chimneys, Fireplaces, Vents, and Solid Fuel Burning Appliances", For Venting requirements.**
C. **Current Edition of American Society of Mechanical Engineers ASME CSD-1, "Controls and Safety Devices for Automatically Fired Boilers", for assembly and operations of controls and safety devices.**
D. **All wiring on boilers installed in the USA shall be made in accordance with the National Electrical Code and/or Local Regulations.**

The following terms are used throughout this manual to bring attention to the presence of hazards of various risk levels, or to important information concerning product life.

DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death, serious injury or substantial property damage.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in moderate or minor injury or property damage.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death, serious injury or substantial property damage.

NOTICE

Indicates special instructions on installation, operation, or maintenance which are important but not related to personal injury hazards.

NOTICE

This boiler has a limited warranty, a copy of which is printed on the back of this manual.
The warranty for this boiler is valid only if the boiler has been installed, maintained and operated in accordance with these instructions.

Surface rust on cast iron sections may be attributed to the manufacturing process as well as condensation during storage. Surface rust is normal and does not affect the performance or longevity of a boiler.

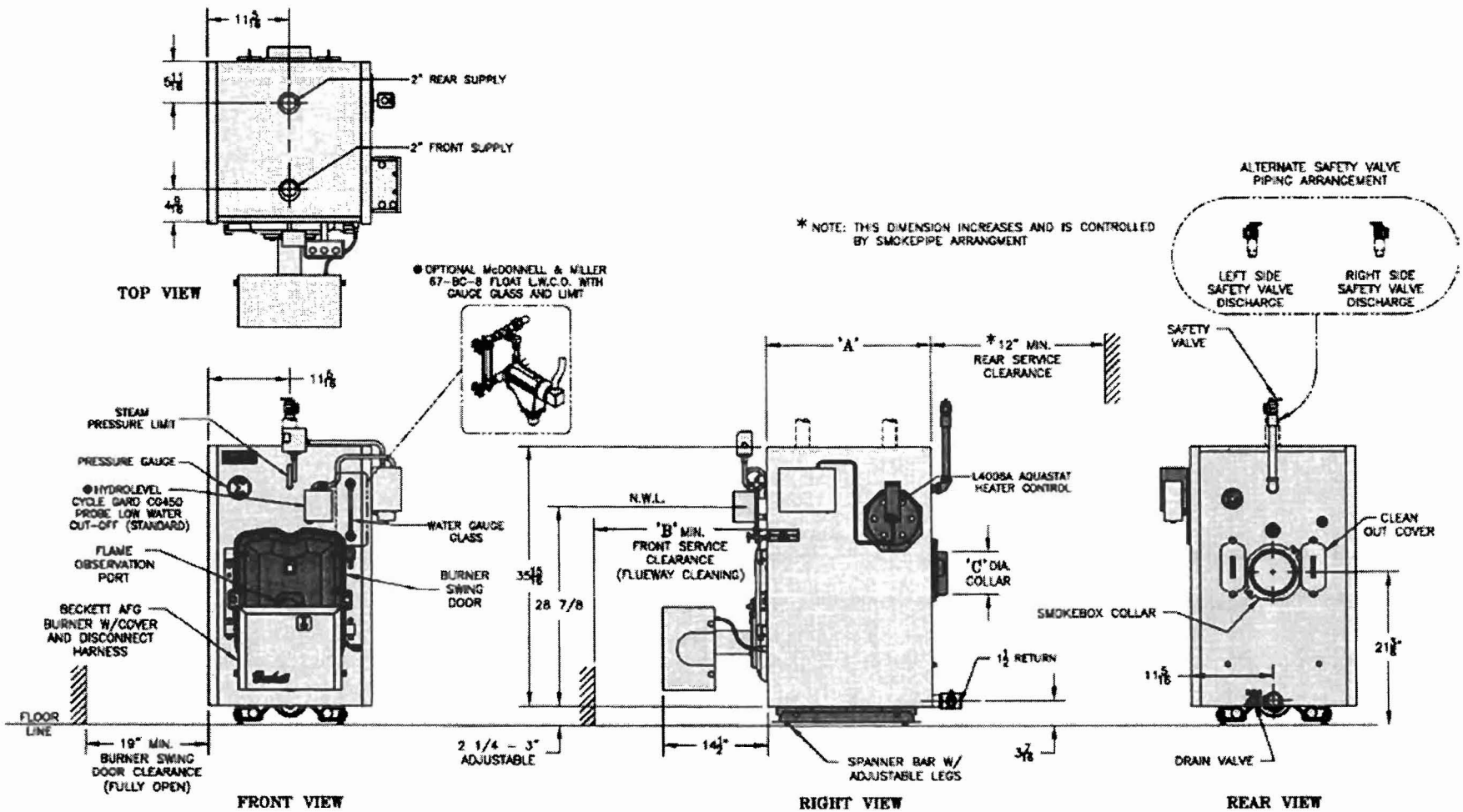

Figure 1: MST288 Thru MST629 Steam Boiler with and without Tankless Heater

TABLE 1A: DIMENSIONAL DATA (SEE FIGURE 1)

Boiler Model No.	Dimensions (See Figure 1)			Water Content (To Normal Water Line) - Gallons		Heat Transfer Surface Area - sq. Ft.	Actual Shipping Weight (LB.)
	"A"	"B"	"C"	With Tankless Heater	Non-Heater		
MST288	22-5/8"	24"	6"	15.3	14.9	20.29	607
MST396	22-5/8"	24"	6"	15.3	14.9	20.29	607
MST513	28-5/8"	30"	6"	19.7	19.3	27.29	744
MST629	34-5/8"	36"	7"	24.1	23.8	34.29	881
NOTE: 1: Maximum Working Pressure: Steam - 15 PSI							

TABLE 1B: RATING DATA

Boiler Model No.	Burner Capacity			I=B=R NET Ratings		Minimum Chimney Requirements			AFUE %
	GPH	MBH	DOE Heating Capacity MBH	Steam MBH	Steam Sq. Ft.	Round In. Dia.	Rectangle In. x In.	Height Ft.	
MST288	0.75	105	92	69	288	6	8 X 8	15	86.0
MST396	1.05	147	127	95	396	6	8 X 8	15	86.0
MST513	1.35	189	164	123	513	7	8 X 8	15	86.0
MST629	1.65	231	201	151	629	7	8 X 8	15	86.0

SECTION I: PRE-INSTALLATION

A. INSPECT SHIPMENT carefully for any signs of damage.

1. All equipment is carefully manufactured, inspected and packed. Our responsibility ceases upon delivery of crated boiler to the carrier in good condition.
2. Any claims for damage or shortage in shipment must be filed immediately against the carrier by the consignee. No claims for variances from, or shortage in orders, will be allowed by the manufacturer unless presented within sixty (60) days after receipt of goods.

B. LOCATE BOILER in front of final position before removing crate. See Figure 1.

1. LOCATE so that vent pipe connection to chimney will be short and direct.
2. BOILER IS SUITABLE FOR INSTALLATION ON COMBUSTIBLE FLOOR. Boiler cannot be installed on carpeting.
3. FOR BASEMENT INSTALLATION, provide a solid elevated base, such as concrete, if floor is not level, or if water may be encountered on floor around boiler.
4. PROVIDE RECOMMENDED SERVICE CLEARANCE, if applicable, as follows:
   a. Clearance from Jacket Front Panel -
      - 24" for servicing burner
      - 24" for flueway cleaning (MST288 & MST396)
      - 30" for flueway cleaning (MST513)
      - 36" for flueway cleaning (MST629)
   b. Clearance from Jacket Left Side Panel -
      - 19" for burner swing door, if opened fully with burner mounted, otherwise 1" with burner removed
      - 12" access clearance to service rear of boiler if right side clearance is less than 12"
      - 1" minimum if right side clearance is 12" or larger to access and service rear of boiler.
   c. Clearance from Jacket Right Side Panel -
      - 6" minimum from external Electrical Enclosure if left side clearance is 12" or larger to access and service rear of the boiler
      - 24" minimum from rear tanklesss heater (if equipped) for servicing and removal of the heater
   d. Clearance from Jacket Rear Panel -
      - 12" minimum for rear smokebox cleaning

      (Note: This dimension will also be controlled by horizontal to vertical to horizontal smokepipe arrangement - See Figures 2 and 14.)
5. For minimum clearances to combustible materials. See Figure 2.

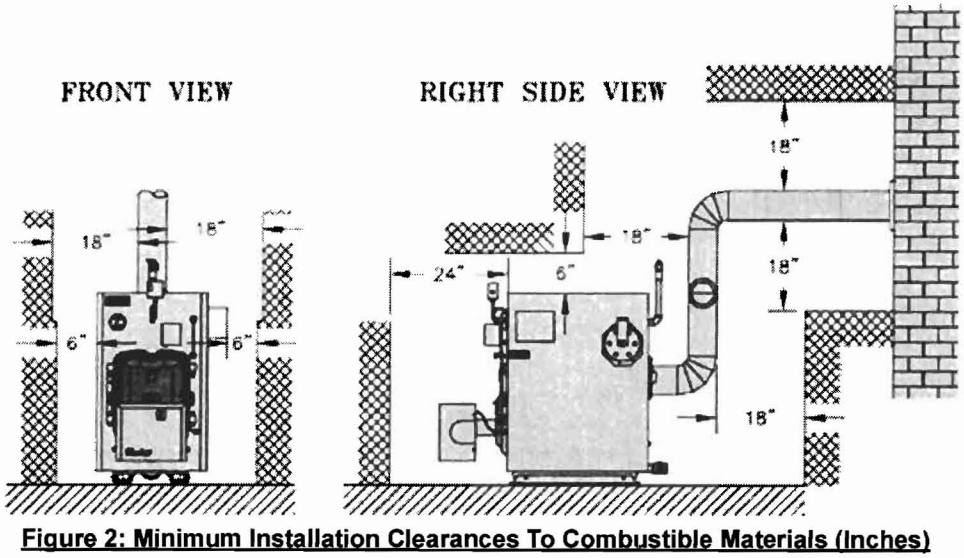

Figure 2: Minimum Installation Clearances To Combustible Materials (Inches)

NOTES:

1. Listed clearances comply with American National Standard ANSI/NFPA 31, Installation of Oil Burning Equipment.
2. MegaSteam™ boilers can be installed in rooms with clearances from combustible material as listed above. Listed clearances cannot be reduced for alcove or closet installations.
3. For reduced clearances to combustible material, protection must be provided as described in the above ANSI/NFPA 31 standard.

NOTICE

Clearance to venting is for single wall vent pipe. If Type L vent is used, clearance may be reduced to the minimum required by the vent pipe manufacturer.

C. **PROVIDE COMBUSTION AND VENTILATION AIR.** Local and National Codes may apply and should be referenced.

WARNING

Adequate combustion and ventilation air must be provided to assure proper combustion and to maintain safe ambient air temperatures.

Do not install boiler where gasoline or other flammable vapors or liquids, or sources of hydrocarbons (i.e. bleaches, fabric softeners, etc.) are used or stored.

Do not install boiler in laundry room, or, in vicinity of clothes dryer to prevent inadequate air supply to burner and lint contamination of burner air intake openings.

1. Determine volume of space (boiler room). Rooms communicating directly with the space in which the appliances are installed, through openings not furnished with doors, are considered a part of the space.

   Volume(ft^3) = Length(ft) x Width(ft) x Height(ft)

2. Determine total input of all appliances in the space. Add inputs of all appliances in the space and round the result to the nearest 1000 BTU per hour.
3. Determine type of space. Divide Volume by total input of all appliances in space. If the result is greater than or equal to 50 ft^3/1000 BTU per hour, then it is considered an ***unconfined space***. If the result is less than 50 ft^3/1000 BTU per hour then the space is considered a ***confined space***.
4. For boiler located in an *unconfined space of a conventionally constructed building*, the fresh air infiltration through cracks around windows and doors normally provides adequate air for combustion and ventilation.
5. For boiler located in a confined space or an unconfined space in a building of ***unusually tight construction***, provide outdoor air.
   a. Outdoor air for combustion may be provided with an optional Burnham Inlet Air Accessory Kit, Part Number 611280031 **(only available and suitable for use on Beckett AFG with burner enclosure cover burner)**. See Section V for installation details.

   or

   b. Outdoor air may be provided with the use of two permanent openings which communicate directly or by duct with the outdoors or spaces (crawl or attic) freely communicating with the outdoors. Locate one opening within 12 inches of top of space. Locate remaining opening within 12 inches of bottom of space. Minimum dimension of air opening is 3 inches. Size each opening per following:

      i. **Direct communication with outdoors.** Minimum free area of 1 square inch per 4,000 BTU per hour input of all equipment in space.

      ii. **Vertical ducts.** Minimum free area of 1 square inch per 4,000 BTU per hour input of all equipment in space. Duct cross-sectional area shall be same as opening free area.

      iii. **Horizontal ducts.** Minimum free area of 1 square inch per 2,000 BTU per hour input of all equipment in space. Duct cross-sectional area shall be same as opening free area.

      Alternate method for boiler located within confined space. Use indoor air if two permanent openings communicate directly with additional space(s) of sufficient volume such that combined volume of all spaces meet criteria for unconfined space. Size each opening for minimum free area of 1 square inch per 1,000 BTU per hour input of all equipment in spaces, but not less than 100 square inches.

6. Louvers and Grilles of Ventilation Ducts
   a. All outside openings should be screened and louvered. Screens used should not be smaller than 1/4 inch mesh. Louvers will prevent the entrance of rain and snow.
   b. Free area requirements need to consider the blocking effect of louvers, grilles, or screens protecting the openings. If the free area of the louver or grille is not known, assume wood louvers have 20-25 percent free area and metal louvers and grilles have 60-75 percent free area.
   c. Louvers and grilles must be fixed in the open position, or interlocked with the equipment to open automatically during equipment operation.

SECTION V: VENTING & AIR INTAKE PIPING

A. CHIMNEY VENTING

1. Chimney venting is an important part of a safe and efficient oil fired appliance system. Contact your local fire and building officials on specific requirements for restrictions and the installation of fuel oil burning equipment. In addition, consult with a professional knowledgeable on the requirements of NFPA 31 – Standard for the Installation of Oil-Burning Equipment and NFPA 211 - Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances for installations in the United States
2. The safe venting of oil fired boilers is dependent on many factors. Some of these factors include:
   a. sufficient draft during the entire heating season to allow for the safe discharge of combustion by-products and;
   b. suitable corrosion protection in the event of condensing flue gases. Only a trained and qualified contractor may install this product.
3. The MegaSteam™ can be vented into a fireclay tile-lined masonry chimney that meets requirements outlined in Paragraph 4 below. It can also be vented into a chimney constructed from type L vent or a factory built chimney that complies with the type HT requirements of UL 103. The chimney and vent pipe shall have a sufficient draft at all times, to assure safe proper operation of the boiler. See Figure 14 for recommended installation.

WARNING

Do not de-rate the appliance. Failure to fire the unit at it's designed input may cause excessive condensation upon the interior walls of the chimney. In addition, the lower input may not create enough draft to adequately evacuate the by-products of combustion.

4. Chimney Inspection – Prior to the installation of any new or replacement fuel burning equipment the chimney shall be inspected by a qualified installer. The chimney shall be inspected for integrity as well as for proper draft and condensate control. Some jurisdictions require the use of a liner when changing fuel types. Some jurisdictions require the use of a liner even when the same fuel is used. At a minimum, the chimney shall be examined by a qualified person in accordance with the requirements of Chapter 11 of NFPA 211, Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances.
   a. Loose Mortar – Loose mortar could be an indication of a prior history of condensing flue gases upon the inside walls of the chimney. Colder climates are more susceptible to this condition. Under no circumstances shall a chimney of this condition be used until it meets the requirements of NFPA 211.
   b. Unlined Chimney – Under no circumstances shall a chimney constructed of brick only be used. Only approved clay liners or listed chimney lining systems shall be used as specified in NFPA 31.
   c. Abandoned Openings – Openings through the chimney wall that are no longer used shall be sealed in accordance to NFPA 211. Often abandoned openings are improperly sealed and usually covered by a gypsum wall covering.
   d. Clean Chimney – Chimney shall be free of all loose debris.
5. Draft Regulator – the draft regulator supplied with the boiler must be used with this appliance. No other draft regulator shall be used. Refer to Figures 14 and 15.

B. CHIMNEY CONNECTOR

1. A chimney connector (vent pipe) is used to connect the boiler to the base of the chimney. The chimney connector should be kept as short as possible. The horizontal length of the chimney connector shall not be greater than 10 feet.

   NOTE: Secure chimney connector to cast iron smokebox collar with three (3) #10 x ½" self drilling hex head TEK screws provided in appropriate Parts Carton. Locate screws around perimeter of connector as shown in Figure 14 and approximately ½" in from edge. Use drill with 5/16" hex bit to drive screws through connector and smokebox collar.

DANGER

The chimney and connector shall be inspected annually for signs of debris and corrosion. Loose mortar at the base of the chimney may be a sign of condensate damage to the chimney. A chimney professional shall be contacted immediately to examine the damage and recommend a solution. Long term operation while in this condition may cause a venting failure and force flue gases into the living space. If the chimney is to be relined use the recommendations in NFPA 31, Appendix E.

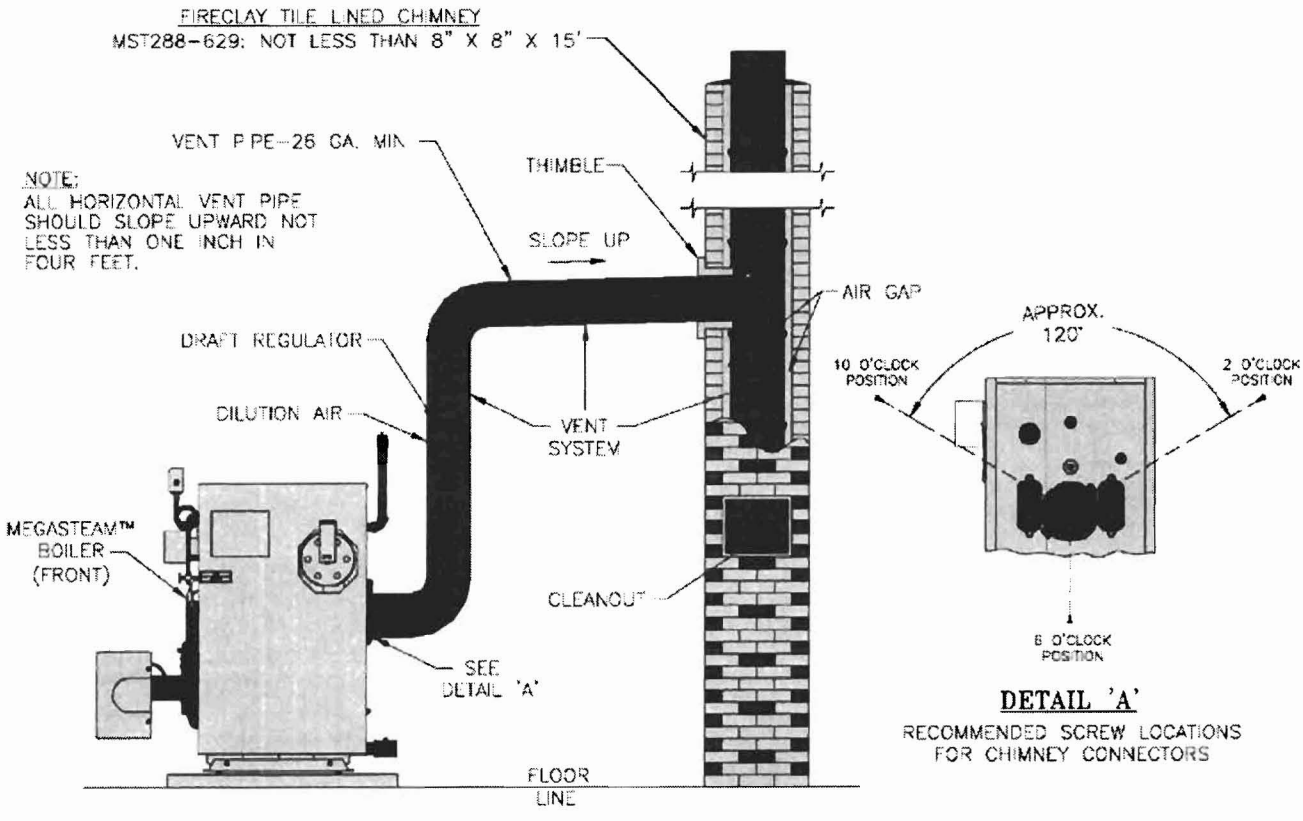

Figure 14: Recommended Vent Pipe Arrangement and Chimney Requirements

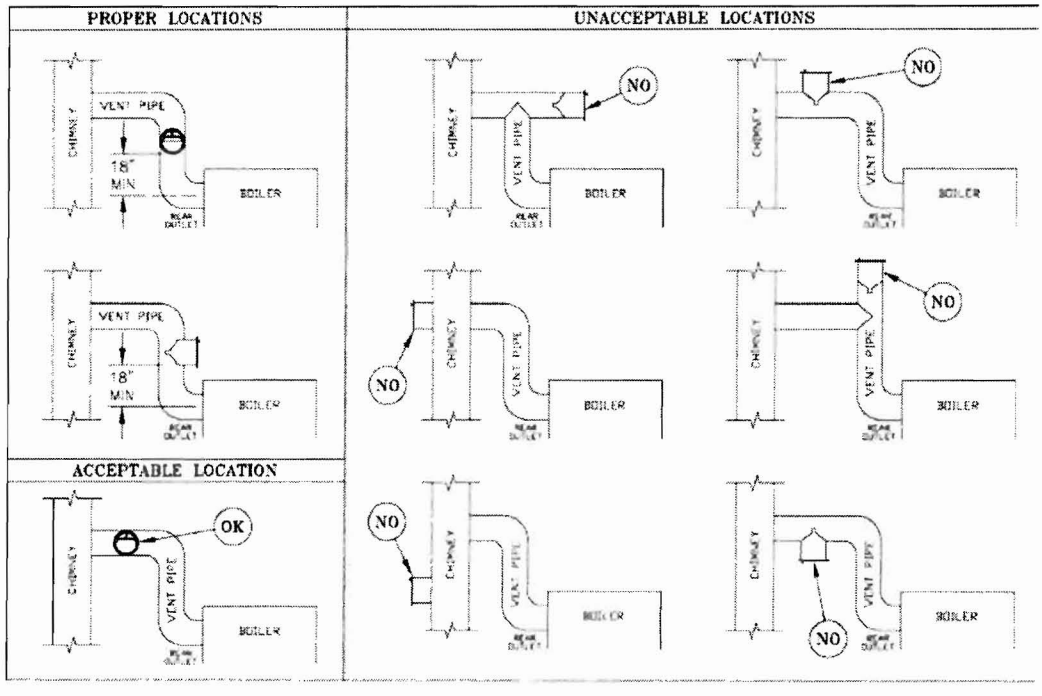

Figure 15: Proper and Improper Locations of Draft Regulator

2. Type B Chimney Connector - a type B chimney connector can be used to transmit the flue gases provided flue gas temperature entering the chimney connector is greater than 310°F.
3. Type L Chimney Connector - a type L vent or other suitable material shall be used for a chimney connector if the temperature or exiting temperature is less than 310°F.

DANGER

Any signs of condensate seepage at the base of the chimney shall be inspected immediately. The discoloration may be a sign of chimney damage and must be remedied immediately.

C. DRAFT

1. The natural draft generated through a chimney is dependent on several factors including, chimney height, temperature of flue gases, cross section area of chimney, chimney wall insulation value, dilution air and total volume of flue gases, to name a few. Make sure that the boiler has been running for at least 5 minutes before measuring the draft.
2. Minimum Draft at Breech (Canopy) – The draft induced by a chimney must create at least a pressure of 0 (zero) inches water column (" w.c.) at the pressure tapping on the canopy mounted on rear of boiler (see Figure 16). The pressure at the canopy **cannot** be positive since this could create a condition that allows flue gas by-products to escape from the draft regulator. A negative pressure reading up to -.03 inches water column is acceptable for proper operation. (See Table 8, Burner Specifications at the rear of this manual for more details)
3. Minimum Overfire Pressure – The overfire pressure is another piece of information that is often measured, however this should be done for observation purposes only! The breech pressure must be used to qualify the draft condition. See Table 8 for more details as a guide. Actual draft and temperature measurements may be different then those values in the table.

D. STACK TEMPERATURE

1. The temperature of the flue gases has a significant effect on the amount of draft created in a vertical chimney as well as the propensity to create condensate. The higher the stack temperature, the greater the amount of draft that can be generated. A lower stack temperature not only reduces the amount of draft that can be created but it also increases the possibility that the flue gases could condense in the chimney connector or stack.
2. NFPA 31 has information to help the installer make an appropriate choice of venting materials. In some cases a chimney may have to be lined to create sufficient draft. In other cases, the chimney may have to be lined to prevent the corrosion of a masonry chimney. Consult with a chimney specialist knowledgeable on the requirements for chimney requirements in your area.

CAUTION

Any doubt on the condition of a chimney or it's ability to prevent the generation and accumulation of flue gas condensate, must be relined according to NFPA31.

CAUTION

Use the chimney venting tables as a guide. It is highly recommended that any borderline application should result in the relining of the chimney with a suitable liner that creates sufficient draft and to protect against corrosion caused by flue gas condensate.

3. Baffles – The efficiency of the boiler is based on the insertion of flue baffles supplied with your product. Under no circumstances are other baffles to be used on this product. The baffles are installed in the 2nd pass (two inner flueways) on the MST396, MST513 and MST629 Refer to Section II, Item E, Paragraph 1 for baffle installation. If there is any doubt on the application of this boiler on the intended chimney, consult with your local code officials. At a minimum, remove the baffles to increase the stack temperature. See Table 8 for temperature differential (ΔT) with baffles IN and OUT. In addition, the lower the CO_2 level the higher the stack temperature.

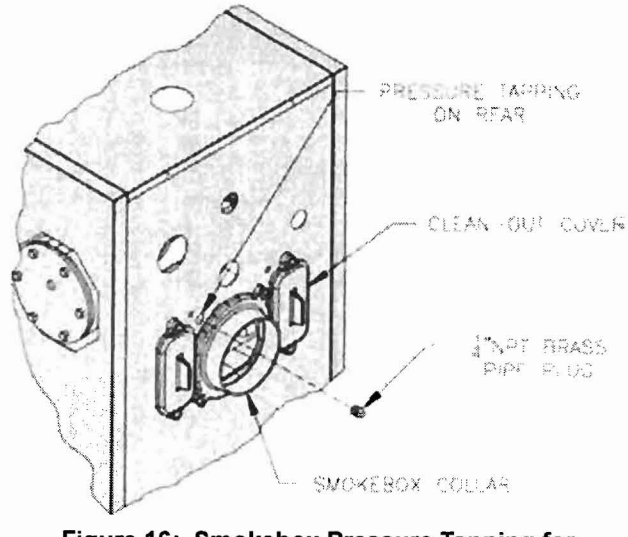

Figure 16: Smokebox Pressure Tapping for Checking Draft at Breech

WARNING

Remove the baffles if there are any signs of condensation in the chimney or chimney connector. Consult with your local chimney professional for recommendations.

E. MINIMUM CLEARANCES

See Figure 2 for details regarding clearances to combustibles for the boiler.

F. OPTIONAL AIR INTAKE PIPING INSTALLATION - All air for combustion can be supplied directly to the burner from outdoors providing that the criteria for chimney, vent connector and minimum stack temperature outlined in this section can be maintained. **(ONLY AVAILABLE WITH BECKETT BURNER).** See Figure 17.

WARNING

Using outdoor air in the middle of winter may result in lower stack temperatures and chimney degradation. Any signs of condensate seepage or discoloration at the base of chimney must be remedied immediately per the details outlined in this section.

Do not reduce size of air intake pipe.

Read, understand and follow combustion air instruction restrictions contained in the Pre-Installation Section of this manual.

1. General
   a. Use 4" dia., single wall galvanized metal pipe and fittings available at most heating distributors for air intake piping. Maximum allowable air intake length is 50 equivalent feet. Each elbow is equal to 6 equivalent feet.

WARNING

Do not exceed maximum allowable air intake length.

   b. Start at burner. Work toward air intake terminal.
   c. Maintain minimum of 1/4 inch per foot slope in horizontal run to air intake terminal. Slope down toward air intake terminal.
   d. Seal all joints gas-tight, using silicone caulk or self-adhesive aluminum tape.
2. After determining location, cut a hole in the wall to accept 4 inch air intake pipe. See Figure 15.
3. Remove the metal knockout in right side of burner cover. Install Burnham Inlet Air Accessory Kit, Part Number 611280031.
4. Mount the Vacuum Relief Valve Tee Assembly (P/N 8116268 included with Kit) or 90° elbow into the burner inlet ring. See Figure 16.
   a. Secure with at least three (3) sheet metal screws evenly spaced around the burner inlet ring.
   b. Assemble the vacuum relief valve balance weight onto the gate. Refer to the vacuum relief valve manufacturer's instructions.

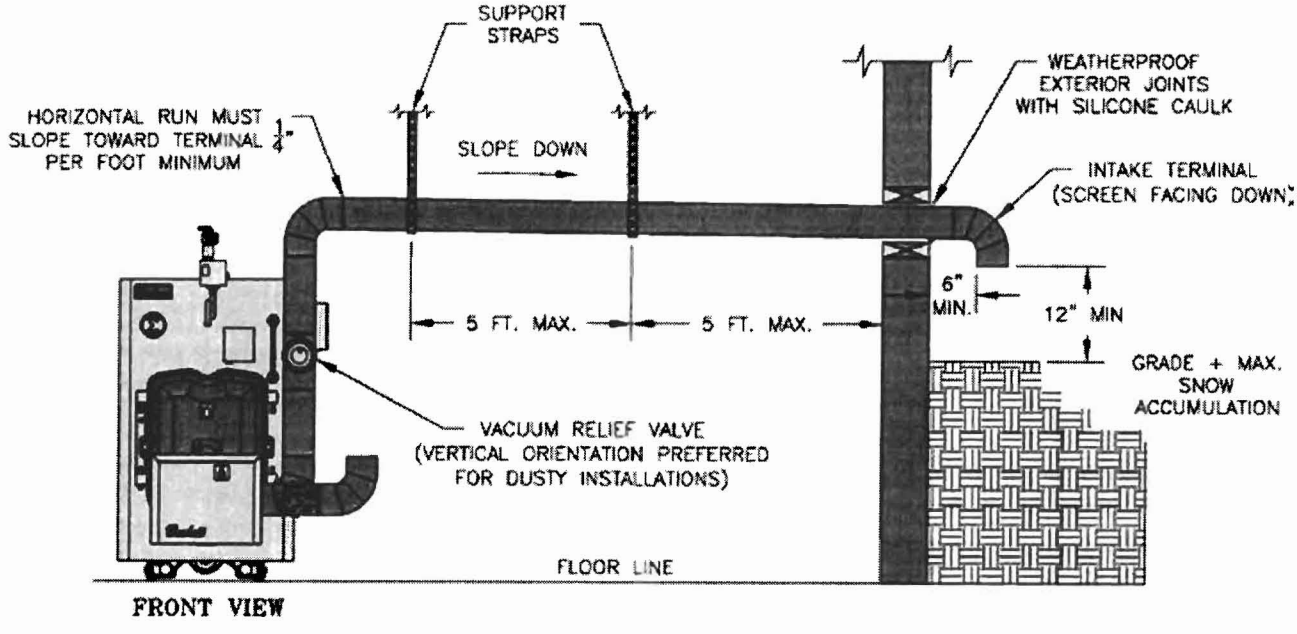

Figure 17: Optional Air Intake Piping Installation - Only Available with Beckett Burner

c. Mount the vacuum relief valve into the tee and fasten with a screw and nut in collar tabs. To ensure proper operation, the gate must be level across the pivot point and plumb. Refer to vacuum relief valve manufacturer's instructions.

5. Install remainder of air intake, securing each joint with at least three (3) sheet metal screws evenly spaced.
6. Install air intake terminal. See Figure 17.

NOTICE

Intake terminal must be at least 12 inches above grade plus snow accumulation.

7. Seal all external joints with weatherproof caulk.

WARNING

Do not locate air intake where petroleum distillates, CFC's, detergents, volatile vapors or any other chemicals are present. Severe boiler corrosion and failure will result.