Masonry Heater Association
Occupational Analysis for Masonry Heater Designers and Builders
Version 2 December 2007

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Introduction

Requirements for MHA Certification
a) A certified Masonry Heater Designer/Builder shall demonstrate proficiency in the skills listed in all sections of this manual
b) Proficiency in each skill area shall be determined through a combination of the following:
(i) verification of relevant past experience,
(ii) competency as certified by a current or previous employer or supervisor,
(iii) customer endorsements,
(iv) relevant educational credits,
(v) oral, written or practical testing
c) See the Heater Mason Training and Certification Program Policies and Procedures Manual for detailed certification criteria.

How to Use This Occupational Analysis

This is the key document that defines the special skills required of those who build masonry heaters. You must be able to demonstrate competency in each of the skills listed in all of the sections of the analysis. This MHA practical and written examinations use the skills listed in this analysis as a guide for their contents. You can use this analysis as a checklist of your own skills as you prepare for certification, and you can use it to assess employees or others whose competency in heater design and construction you are asked to evaluate.

1. Work Safely
1.1 Wear eye protection.
1.2 Wear foot protection.
1.3 Wear ear protection.
1.4 Wear protective clothing.
1.5 Wear hand protection.
1.6 Wear dust masks and respirators.
1.7 Wear a hard hat.
1.8 Lift and moving heavy objects.
1.9 Use forklifts, dollies, hand trucks and motor vehicles.
1.10 Secure loads.
1.11 Maintain a safe work environment.
1.12 Follow health and safety legislations.

2. Analyze customer requirements and give advice
2.1 Explain the operational and performance characteristics and limitations of masonry heaters.
2.2 Compare masonry heaters with other hearth and heating system options.
2.3 Determine the heating, fire viewing, and decor requirements of the customer.
2.4 Explain the characteristics of optional facing materials.
2.5 Prepare sketches showing location options.
2.6 Provide advice on the most effective locations for performance, aesthetics and safety.
2.7 Explain limitations of system locations such as outside walls and confined areas.
2.8 Identify and explain masonry heater and component options.
2.9 Discuss heating capacities of various masonry heater options.
2.10 Explain venting requirements.
2.11 Discuss the effects of a tight building envelope on the operation of a high-capacity exhaust system.
2.12 Discuss effective heat distribution of masonry heaters.
2.13 Discuss requirements and procedures for obtaining a building permit.
2.14 Determine information that may be required for insurance purposes.

3. Develop System Designs
3.1 Determine the type, size and configuration of a heater.
3.2 Determine associated components such as bake oven, facing options, water coils, heated bench, wing wall, etc.
3.3 Perform heat output calculations.
3.4 Specify foundation requirements.
3.5 Determine code requirements for masonry heaters.
3.6 Determine requirements for clearance reduction systems.
3.7 Determine code requirements for chimneys.
3.8 Determine access requirements for cleaning of internal passages.
3.9 Interpret manufacturer's instructions for factory-built masonry heaters.
3.10 Prepare clear and accurate sketches

4. Design Masonry Heaters
4.1 Design a firebox.
4.2 Design heat transfer passages.
4.3 Design access requirements for cleaning internal passages.
4.4 Determine the need for a by-pass damper and/or chimney damper.
4.5 Design and construct a gas slot.
4.6 Assess the need for an outdoor combustion air supply.
4.7 Design a chimney to code requirements.
4.8 Determine the facing material.
4.9 Design the layout of the heater facing material.
4.10 Specify metal components such as doors, lintels and dampers.
4.11 Design and construct a bake oven.
4.12 Design and construct a heated bench.
4.12 Design a capping assembly.
4.13 Allow for thermal expansion.

5. Prepare Job Cost Estimates
5.1 Evaluate material requirements.
5.2 Evaluate labour requirements.
5.3 Compile a list of necessary components.
5.4 Research and record prices.
5.5 Determine shipping costs.
5.6 Estimate the time required to complete the work.
5.7 Complete a cost estimate.
5.8 Provide a cost estimate to the client.

6. Review Installation Requirements and Prepare for the Installation
6.1 Interpret installation drawings and specifications.
6.2 Assess installation issues prior to work proceeding.
6.3 Review all installation requirements.
6.4 Obtain local building permits licenses etc.
6.5 Determine other trades are on schedule.
6.6 Gather all necessary components, tools and equipment.
6.7 Load materials, equipment and documentation into the service vehicle.

7. Uncrate and Inspect Components
7.1 Inspect unopened crates carefully and record visible damage.
7.2 Uncrate components carefully to avoid damage and injury.
7.3 Dispose of crate materials safely.
7.4 Compare parts list or packing slip to crate contents.

8. Assemble Factory-built Heater Kits
8.1 Use hand and power tools.
8.2 Inspect existing chimneys.
8.3 Gather the necessary tools, components and materials.
8.4 Protect building components.
8.5 Review installation instructions.
8.6 Confirm installation clearances in accordance with manufacturer's instructions.
8.7 Assemble the core components.
8.8 Install expansion joints.
8.9 Install facing materials.
8.10 Install metal components.
8.11 Install a gas-tight, permanent connection between the heater and its chimney.
8.12 Install combustion air supply components.
8.13 Meet code requirements.
8.14 Observe manufacturer's installation instructions.
8.15 Clean the work area.
8.16 Record installer's name and date of installation or service in an appropriate location on the appliance or owner's manual.

9. Use masonry units and mortars.
9.1 Use masonry units.
9.2 Use mortar.
9.3 Assemble heater core components.
9.4 Install metal components.
9.5 Apply the facing material.
9.6 Create an expansion joint.

10. Advise Client of Proper Operating and Maintenance Procedures
10.1 Provide the client with an operating manual.
10.2 Discuss the contents of the operating manual.
10.2 Review the heater, break-in instructions.
10.3 Explain fueling requirements.
10.4 Discuss firing temperatures.
10.5 Explain routine system maintenance requirements.
10.6 Explain warranty policy and limitations.
10.7 Provide the customer with a contact person.
10.8 Acknowledge, in writing, that the operating and maintenance instructions and warranty have been received and understood.