Chimney Cap/Crown Specifications

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Summary: These specifications were derived using best practices published by the Brick Industry Association Technical Notes 19B - Residential Chimneys - Design and Construction Rev [June 1980] (Reissued Apr. 1998) and 40+ years of experience.

General Provisions:

1. Contractors must include with their written bid, up-to-date Workers' Compensation Certificates and a Certificate of General Liability Insurance indicating the contractor has insurance coverage paid in advance.

2. Contractors are to include in their proposals steps and practices they'll take to prevent damage to surfaces not involved in the repair of the chimney and chimney cap/crown including, but not limited to:

- roof
- driveway
- exterior wall surfaces

3. Contractors shall propose a payment schedule that compensates them for work done in a timely manner in accordance with these specifications

Chimney Rebuilding:

Carefully remove the existing chimney cap/crown and any rows of brick that are in poor condition. State clearly in your proposal how many brick you intend to remove and re-lay. Salvage as many/all of the brick as possible. Only reuse brick that are in very good or excellent condition. If in doubt, bring down questionable brick and ask for guidance from the homeowner.

Prior to the beginning of the job, have on hand at least 70 percent of the brick that will match the existing brick in the event many existing chimney brick are in poor condition. Obtain the owner's approval that these brick match as close as possible the existing chimney brick.

Inspect the exposed flue liners for cracks, deterioration, and/or damage. Replace if necessary.

Use only Type N Portland cement/lime mortar for relaying the courses of brick that will be repaired. Pure hydrated lime and sand is an acceptable alternate.

Mortar Matching Note:

Inspect the existing mortar farther down the chimney and find local sand that has the **same particle size and mixture/range of colored sand grains**. Before mixing mortar have the homeowner approve the sand you intend to use. Doing this ensures the new repair mortar will have the best chance of a color match once the mortar paste wears off the sand particles in the new mortar.

Tuck-point the entire chimney below the repaired area down to the roofline where mortar has deteriorated and/or is missing.

Fill the void space between the outer brick and flue liners with rubble so the chimney is solid.

Match the current brick design of the chimney including any corbeling or other special features. Take high-resolution photos of the chimney and share with the homeowner before the job begins.

Chimney Cap/Crown:

Refer to the illustration on the last page of these specifications for how the cap/crown shall be built. The cap/crown is to overhang all sides of the chimney an equal amount.

The new chimney cap/crown shall be cast in place using high-strength concrete such as Sakrete High-Strength Concrete mix or equivalent. Add no less than one full shovel of pure Portland cement to each 80-pound bag of the concrete mix to achieve close to a 5,000 PSI final design strength. Concrete shall be mixed so the slump does not exceed 5 inches. Too much mix water weakens the concrete.

Steel reinforcing rods must be used in the cap or crown. They shall be primed and painted before installation. Use Rustoleum rusty-metal primer and any high-gloss finish paint. Use ⅜-inch diameter rods or no larger than 1/2-inch bars.

Shorter bars shall be placed centered in between the multiple flue liners and one on the other side of the two outer flue liners for a total of five bars. Place a steel bar within 2 inches of the outer edge of each side of the overhang. A minimum of two longitudinal bars shall be placed centered between the outer edge of the cap and outer edges of the flue liners. The bars shall extend to within 1 inch of the cap/crown form. A minimum of 1.5 inches of concrete must be beneath the steel rods.

Use a smooth oiled form board for the bottom of the overhang. A ⅜-inch-thick piece of wood ¾-inch high planed in a rough v-shape shall be nailed to this form board with finish nails. See the illustration on the last page of these specs for clarity. Place this strip 1 inch in from the outer edge of the cap/crown form. The narrow part of the v shall be facing the sky. This will create a drip kerf on the underside of the overhang.

The v-shape is critical so the installer will be able to remove the wood strip once the forms are stripped. Be sure this piece of wood is smooth and oiled so it will release from the cast concrete with ease.

As the cap/crown is being poured, it's imperative the finisher taps the underside of this form board as well as the side board of the overhang form. This ensures a smooth finish to the overhang once the forms are removed. If honeycomb concrete is discovered once the form is removed, then the contractor shall immediately apply a cement stucco over the honeycombed concrete.

Bond Break/Flashing:

A bond break flashing must be placed on top of the slightly humped rubble that's flush with the last course of the brick. A skim coat of brick mortar can be spread over the rubble to create a smooth surface so the flashing bond break is not punctured by a sharp piece of masonry in the rubble. This flashing shall be creating using York Manufacturing Yorkshield 106 HP in solid copper.

The flashing material can be created using several pieces of the copper material. The lap joints must be traditional hammered interlocking flat seams with no soldering required. Make the interlocking flat seam by folding each piece of the copper with a 3/4-inch bend. This will create a one-piece flashing and/or bond break across the entire top of the chimney.

The flashing must extend out beyond the edges of the brick one inch and eventually be bent at a 45-degree angle once the cap/crown form is removed.

The flashing must lap up onto the four sides of each flue liner at least one inch. The cuts at the corners shall be made with great care to minimize openings at the rounded outer corners of the flue liners. Use high-quality duct tape to adhere the flashing to the sides of the flue liners prior to installing 1/2-inch foam to create a gap between the poured cap/crown and the flue liners. **The concrete cap shall not contact the flue liners.**

After pouring the cap/crown, the 1/2-inch foam shall be removed. The resulting gap shall be filled with foam backer rod to within ⅝-inch of the top of the concrete cap/crown. The remaining gap shall be filled with a high-quality polysulfide, butyl, or silicone rubber caulk. Mound the caulk up across the joint so if it shrinks it will still shed water.

Finishing the Cap/Crown:

The poured concrete shall be finished with a magnesium or wood float. The high point of the cap/crown shall be the midpoint longitudinal axis of the chimney. The concrete shall be poured so there is slope to the outer edges of the cap/crown and that no puddles will form on the cap/crown.

Once the crown is poured and finished, it shall be covered immediately with 6-mil plastic and secured to the form so it will not be blown off by wind. This plastic will minimize water loss from the concrete. This plastic shall remain on the cap for no less than 48 hours. Cut openings in the plastic above any flue liner that's serving a working gas-fired appliance such as a water heater, furnace, gas range, etc. in the house to prevent carbon monoxide buildup within the house.

Once all work is complete and prior to the scaffolding being taken down, the chimney and new concrete cap/crown shall be sprayed with two coats of a solvent-based silane-siloxane water repellent. This task must be completed by two people one wearing a backpack leaf blower.

As the clear liquid is being applied, the person with the leaf blower blasts the surface of the brick with the air stream to drive the silane-siloxane liquid deep into the brick and mortar. Do this with each coat.

Follow the instructions on the label of the clear sealer and be sure to apply the second coat in the time frame stated on the label. Do not exceed the time window allotted for applying the second coat.

Chimney Cap/Crown Cross Section:

Use the attached cross section drawing when creating, forming, and constructing the chimney cap/crown. Spaces between elements are to provide clarity in the drawing.

These specifications including the cap/crown cross section are to be an integral part of the contract between the parties.