

**Cap**

1. For maximum weather resistance, a chimney cap should extend beyond the chimney walls and incorporate a drip feature at its edge. This prevents water (from melting ice or snow and straight-down rain showers) from streaming down over the chimney walls for long time periods.
2. The flue tile should project at least four (4) inches above the top surface of the cap. (This requirements may be greater in some code jurisdictions.) In most cases, the cap material should not be bonded or mechanically anchored to the flue tile, as vertical movement of the flue tile due to thermal expansion will be transferred to the cap material and crack the cap or lift it from its bedding material, thus opening it to water penetration. Instead, there should be a clear opening between the cap material and the flue tile which is wide enough (3/8 inches to 1/2 inch) to receive a resilient caulking material and the flue tile. The type of caulking material which is suitable for use is discussed under the heading Caulking Materials, below.
3. The cap should have a positive slope away from the center (or flue tile) toward the edges so that water will drain away from, rather than toward the flue tile.
4. Many chimney caps consist merely of a trowel-applied, thin parge coat of mortar, often finished to a feather-edge at the perimeter. These types of “caps” usually crack due to shrinkage of the mortar soon after construction and provide ready channels for water penetration. Often, the thin mortar becomes de-bonded from the brick courses below, forming a horizontal crack which serves as another avenue for water penetration.

Metal caps and hoods can also be constructed to provide weather resistance to chimney tops.

If concrete is used as the cap it should be thick enough to permit the installation of metal reinforcement. Such reinforcement, to be durable, should be galvanized.

All concrete or masonry caps should be underlain by flashing. With flashing under the cap, any water which enters the cap materials will be mostly confined to the cap, and will be largely prevented from trickling down into the brickwork below.

## **Chimney Walls**

1. Any obvious cracks or openings in the chimney walls should be regarded as suspect points for water penetration. These include separating cracks between brick units and mortar joints, cracks which extend through brick units and adjoining mortar joints, “bug holes” in mortar joints (where mortar doesn’t completely fill the joint), badly cracked or spalled brick, and other openings such as may have been created by fasteners used to attach items such as wires, antennas, etc...
2. Sloped or projecting surfaces such as created by corbelling or “racking” impede the flow of water over such surfaces, increasing the amount of contact time which water has with masonry. Such features also are often the site of separation cracks and exposed core-holes of brick units. They can, therefore, be major contributors to water permeance of the masonry.
3. Mortar joints play an important role in the water resistance of brick masonry. For chimney construction, only the concave, vee, or compacted grapevine joint should be used. The reason is that these joints provide two features essential to the shedding of water, viz., a sloping profile and densified outer surface. Raked joints are to be avoided for chimney constructions (as well as all other weather-exposed masonry) as they provide ledges for the accumulation of water and an outer surface which is usually coarse and non-densified.
4. Head joints in brick masonry are often not filled completely to the full bed-depth of the brick. This is not usually obvious, as a very small amount of mortar at the front edge of such joints is sufficient to allow the joint to be tooled to give the appearance of being sound. Discovery of such deficient joints can sometimes be accomplished by pushing a knife blade into the joint. More commonly, such discovery can only be accomplished by removing portions of the masonry. The problem with such head joints is that they are the most common source of leakage in brick walls.

## **Roof to Chimney Flashing**

1. Flashing from the roof to the chimney is necessary to prevent water from leaking into the roof area where the chimney penetrates the roof. The “flashing” is normally in two parts –step flashing which is inserted under the roof shingles (or other roofing materials) and stepped counterflashing which comes out of the chimney walls and turns down over the step flashing. The vertical legs of the flashing and counterflashing should be caulked with a construction sealant to prevent wind-driven rains from blowing into these areas.

2. When the dimension of the chimney parallel with the roofline (usually regarded as the chimney width) exceeds 30 inches, a cricket is usually required. Use of a cricket for chimneys is useful in aiding roof drainage from behind wide chimneys, again minimizing contact time of the water with the chimney, and preventing ponding of water.
3. Flashing materials should be metal – preferably copper, galvanized steel, or stainless steel. Some plastics may be suitable, but are less durable.
4. Omission of flashing and counterflashing at the roof/chimney intersection, and the substitution of construction sealants (caulks) for these materials is considered inferior workmanship. The weather-resistance of such details is unreliable.

### **Caulking Materials**

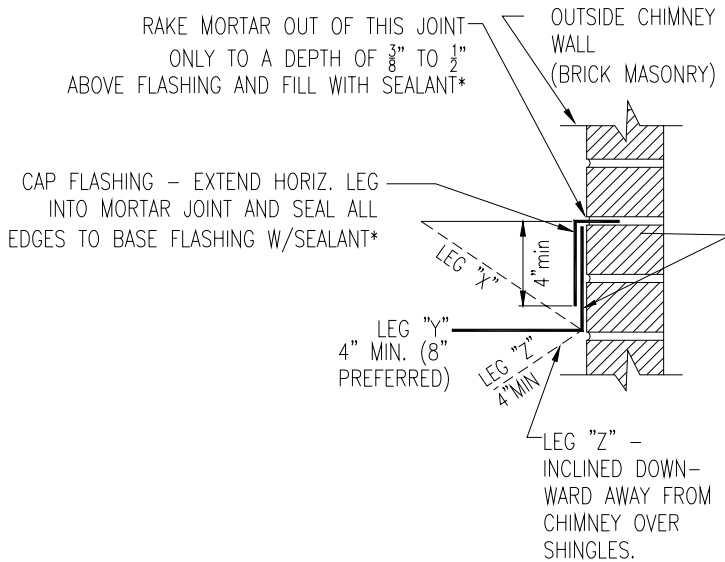
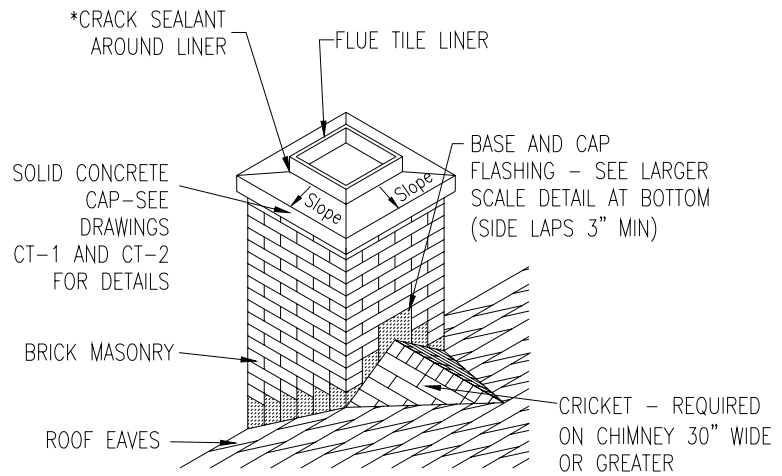
1. Suitable caulking materials for use with products which contain Portland cement – such as mortar and concrete – must not contain acids. For this reason, silicone caulks must be carefully selected, as many of these have acid curatives, which prevent proper bond to mortar and concrete. Such caulking used for joints may look watertight, but in fact may leak due to improper or incomplete bond.
2. Caulking materials should be able to accommodate whatever movement takes place at a joint without tearing the joint material or pulling it loose from the adjacent materials.

### **Details and Summary**

The attached sketches, drawing no. RCD-1, CT-1, and CT-2 show and specify many of the features and materials discussed above. It is suggested that these sketches be used in conjunction with the foregoing checklist as an aid in interpretation of terminology and visualization of the features discussed.

ACCORDING TO MOST BUILDING CODES A CHIMNEY SHOULD EXTEND AT LEAST 3 FEET ABOVE THE HIGHEST POINT WHERE IT PASSES THROUGH THE ROOF AND AT LEAST 2 FEET HIGHER THAN ANY POINT ON THE ROOF WITHIN 10 FEET OF THE CHIMNEY

\*NOTE: WHERE THE WORD "SEALANT" OR "CAULKING" IS USED IT SHALL MEAN DOW CORNING CONCRETE CRACK SEALANT (DAP #8645) OR EQUIVALENT



BASE FLASHING—APPLY ROOFING MASTIC TO BACK SIDE OF VERTICAL LEG AND SECURE TO BRICK MASONRY. LEG "X"—WHERE FLASHING IS INCLINED UPWARD AWAY FROM CHIMNEY IT SHOULD EXTEND UNDER SHINGLES TO SAME ELEVATION AS HORIZONTAL LEG OF CAP FLASHING. LEG "Y"—HORIZONTAL EXTEND UNDER SHINGLES AS SHOWN.

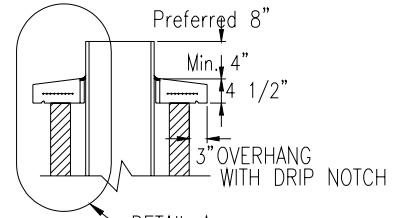


RESIDENTIAL CHIMNEY TOP DETAILS  
SUGGESTED WEATHER-RESISTANT FEATURES  
SEE DRAWING NO'S CT-1 & CT-2 FOR CONCRETE CAP

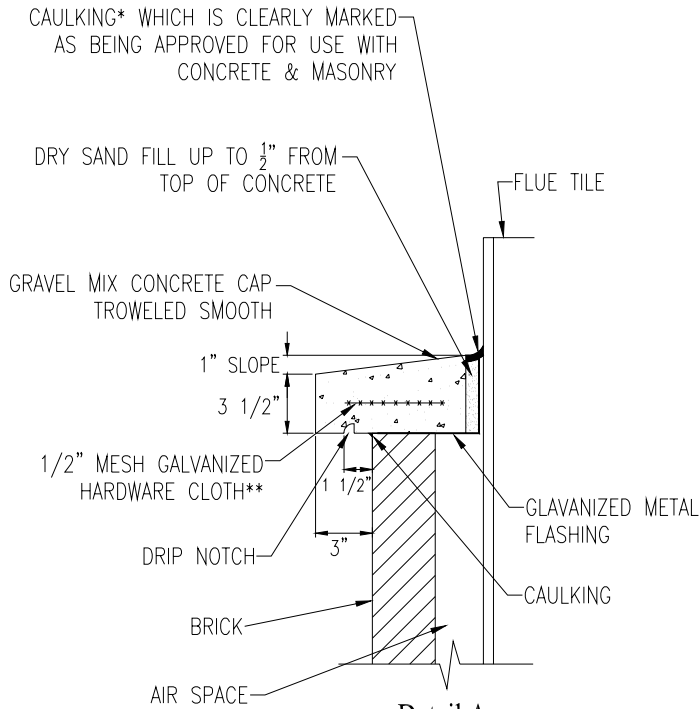
DWG NO. RCD-1

SCALE: NTS

NOTE: SOME BUILDING CODES SPECIFY THIS DIMENSION - CHECK LOCAL CODE

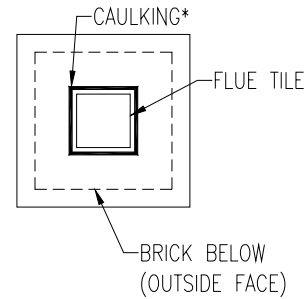


DETAIL A  
Section View



Detail A

\*\*LAP ALL CORNERS 3" MINIMUM



Plan View



CAST IN PLACE CONCRETE CHIMNEY TOP  
SUGGESTED CONSTRUCTION DETAILS  
(SEE DWG CT-2 OF 2 FOR SUGGESTED FORMING DETAILS)

DWG NO.  
CT-1 OF 2  
SCALE: NTS

1/2" POLYSTYRENE INSULATION BOARD  
TIED IN PLACE WITH STRING  
(ALL TO BE REMOVED AFTER CONCRETE CURES  
ALONG WITH OTHER FORM MATERIALS)

GALVANIZED SHEET METAL  
FLASHING - SEAL ALL LAPS  
WITH SILICONE CAULKING  
WHICH IS CLEARLY MARKED AS  
BEING APPROVED FOR USE  
WITH CONCRETE & MASONRY

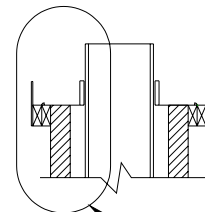
EDGE FORM

QUARTER ROUND DRIP  
NOTCH FORM  
- SECURE TO BOTTOM FORM  
WITH A BEAD OF ANY TYPE  
OF SILICONE CAULKING  
- DO NOT NAIL

DOUBLE 2X4 BOTTOM FORM  
(DO NOT NAIL TO BRICK)

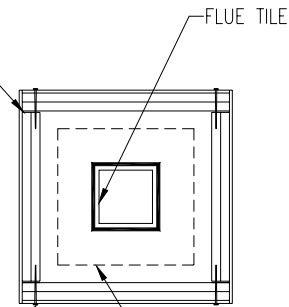
BRICK

FLUE TILE



DETAIL B  
Section View

LEAVE 1/4" GAP AT EACH END OF BOTTOM FORMS  
ON TWO SIDES AS SHOWN TO ALLOW THE OTHER  
SIDES TO BE DRAWN UP TIGHT AGAINST  
THE SIDES OF THE CHIMNEY BY TIGHTENING THE  
LAG SCREWS. CAULK FORMS BEFORE POURING.



LAG SCREWS  
& NASHERS

BRICK BELOW  
(INSIDE FACE)

Plan View

Detail B



CAST IN PLACE CONCRETE CHIMNEY TOP  
SUGGESTED FORMING DETAILS  
(SEE DWG CT-1 OF 2 FOR SUGGESTED  
CONSTRUCTION DETAILS)

DWG NO.  
CT-2 OF 2  
SCALE: NTS