CLAIMS

1. A method of fabricating a semiconductor substrate, the method comprising:

(a) vertically etching a feature having an opening, sidewalls and a depth into one or more layers formed on the semiconductor substrate;

(b) depositing a liner material onto the sidewalls of the feature; and

(c) performing an etch of a carbon mask used to define the opening of the feature, the etch:

(i) removing excess deposits of the liner material that has collected in the opening of the feature defined by the carbon mask; and

(ii) shaping the carbon mask in the vicinity of the opening of the feature.

2. The method of claim 1, further comprising iterating (a), (b) and (c) two or more times until the feature has reached a desired depth into the one or more layers formed on the semiconductor substrate.

3. The method of claim 1, further comprising performing (b) and (c) in a same chamber of a substrate processing tool.

4. A substrate processing tool, comprising:

a processing chamber;

a substrate holder for holding a substrate within the processing chamber;

a controller for controlling operation of the substrate processing tool during processing of the substrate, the controller arranged to control the substrate processing tool to:

(a) deposit a carbon liner on sidewalls of a feature (i) etched into the substrate and (ii) defined by an opening in a carbon mask; and

(b) etch the carbon mask to (iii) shape the carbon mask and (iv) remove from the opening incidental material deposited for the carbon liner.

5. The substrate processing tool of claim 4, wherein the etch of the carbon mask is performed to shape the carbon mask so that it is tapered from wide to narrow toward the feature.

6. The substrate processing tool of claim 4, wherein the controller is further configured to control an etching environment within the processing chamber so that the carbon mask and the opening are etched, while the carbon liner on the sidewalls of the feature are substantially not etched.