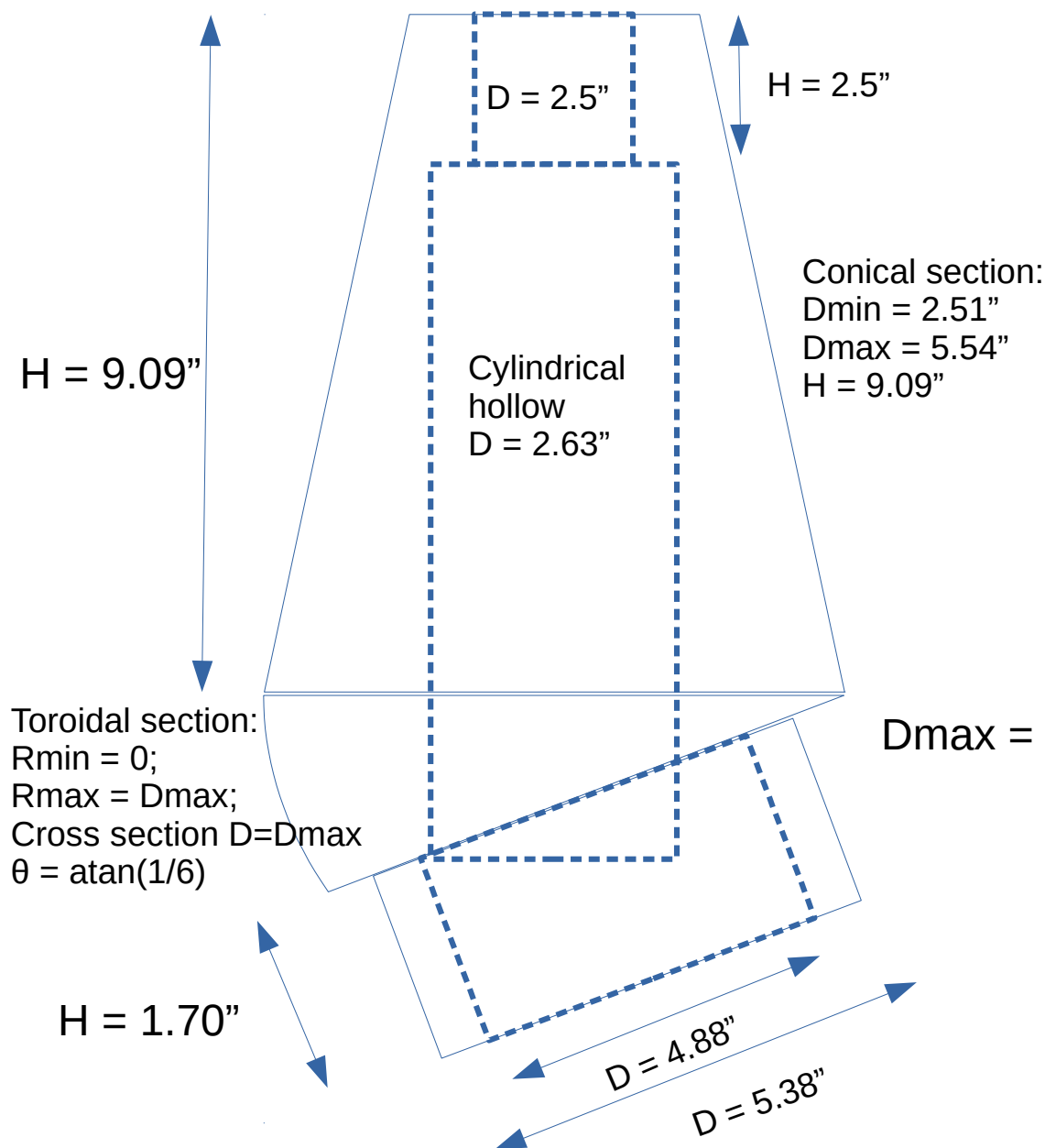




Nosecone: 3:1 aspect ratio cone with spherical tip

$$D_{\min} = D(1 - L/(3D)) = 2.51''$$



$L = 13.3''$

$$L_c = 3 \times D_{\max} = 16.62''$$

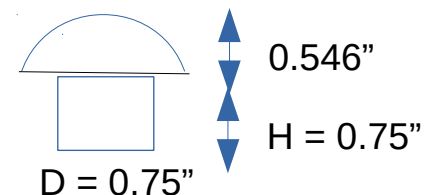
$$r_{\text{cap}} = (L_c - L)/(\sqrt{37}-1) = 0.653''$$

$$d_{\min} = 12(L_c - L)/(37 - \text{sqrt}(37)) = 1.239''$$

$$h = L - 9.09'' - (L_c - L) / \sqrt{37} = 3.664''$$

$$r_{\text{cap}} = 0.653''$$

Spherical $\theta = \pi/2 - \text{atan}(1/6)$



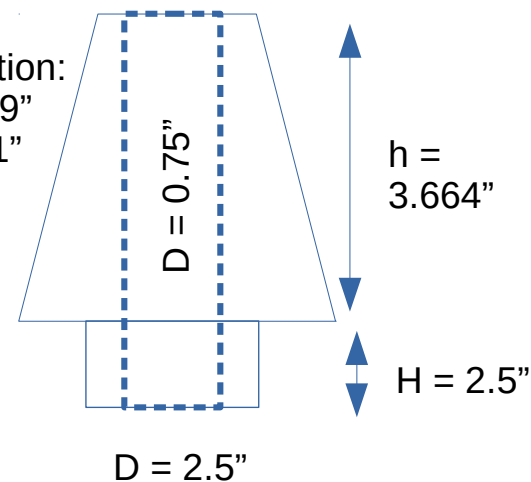
Conical section:

$$d_{\min} = 1.289''$$

$d_{max} = 2.51''$

$$H = 9.09''$$

Dmax = 5.54"



Central support: 120 deg symmetry

$$r(z, \theta) = \min \left\{ \frac{\Delta x + a \left\{ 1 - \sqrt{1 - \frac{36 \Delta x}{37 a} \left(2 + \frac{\Delta x}{a} \right) \tan^2(\theta)} \right\}}{\left(1 + \frac{36}{37} \tan^2(\theta) \right) \cos(\theta)}, R_{bus} (1 - z/Y) \right\} \quad z = \{0, Y\}$$

$$\theta = \{-60 \text{ deg}, 60 \text{ deg}\}$$

$$r(z, \theta) = \min \left\{ \frac{\Delta x + a_0 \left\{ 1 - \sqrt{1 - \frac{36 \Delta x}{37 a_0} \left(2 + \frac{\Delta x}{a_0} \right) \tan^2(\theta)} \right\}}{\left(1 + \frac{36}{37} \tan^2(\theta) \right) \cos(\theta)}, R_{bus} - t_{wall} \right\} \quad z = \{-z_{shoulder}, 0\}$$

$$a = [\sqrt{R^2 + L_c^2} - z] \tan(\phi) = [\sqrt{R^2 + L_c^2} - z] / 6 \quad b = [\sqrt{R^2 + L_c^2} - z] \frac{\sin(\phi)}{\cos^2(\phi)} = \frac{\sqrt{37}}{36} [\sqrt{R^2 + L_c^2} - z]$$

$$\phi = \text{atan}(1/6)$$

$$Y = 8''$$

$$L_c = 6R = 16.62''$$

$$R = 5.54''/2$$

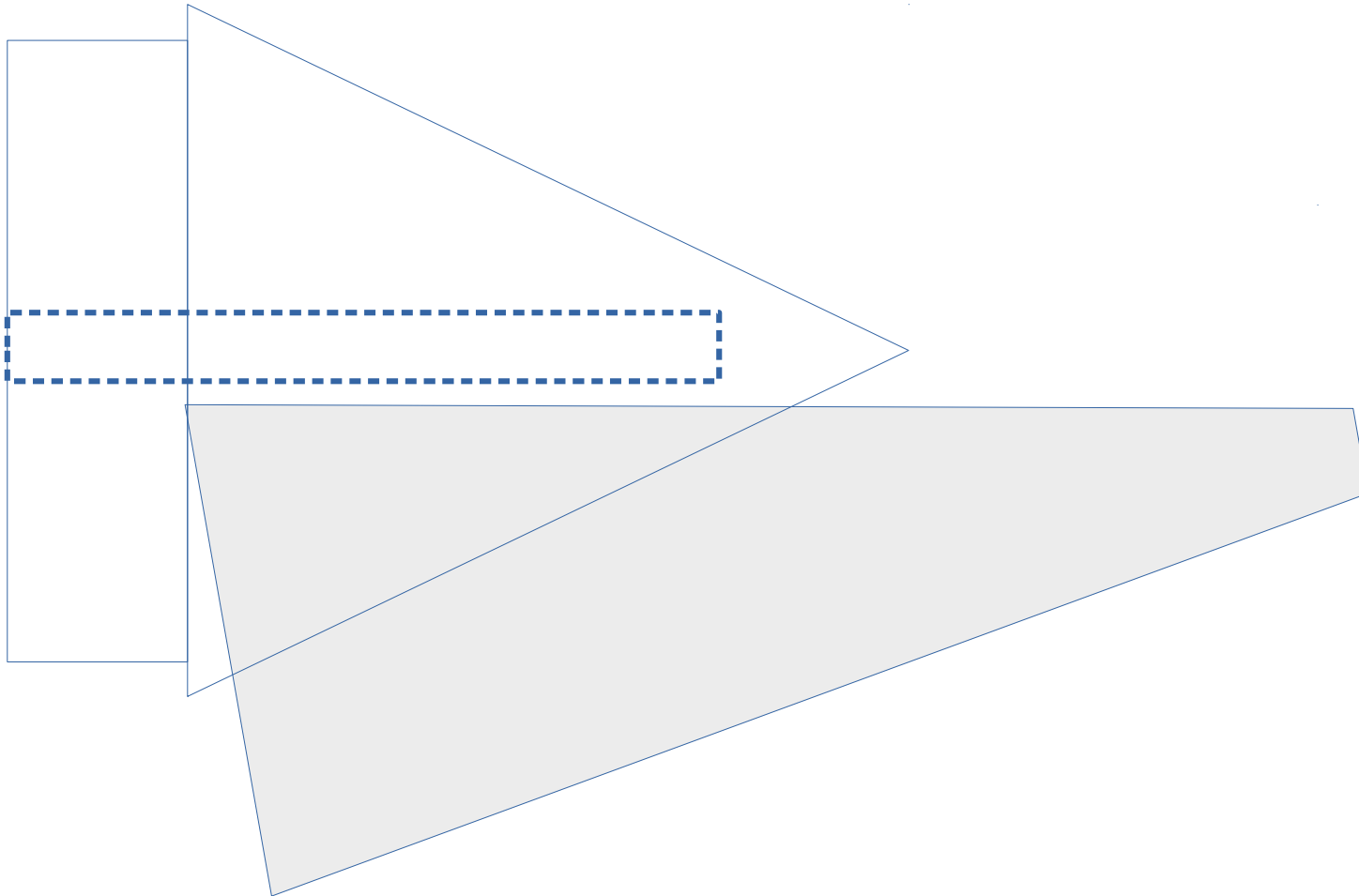
$$d = 0.4''$$

$$R_{bus} = 7.672/2 \text{ inch}$$

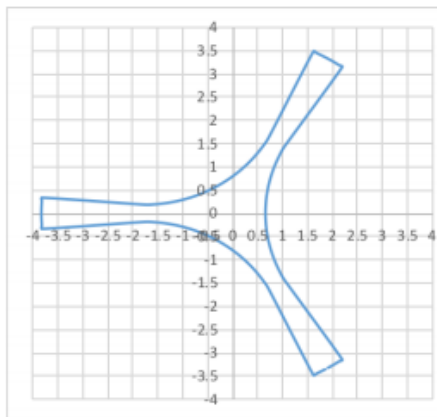
$$z_{shoulder} = 2 \text{ inch}$$

$$\Delta x = \frac{(2 - \sqrt{3})R + d}{\sqrt{3}} = 0.6595 \text{ inch}$$

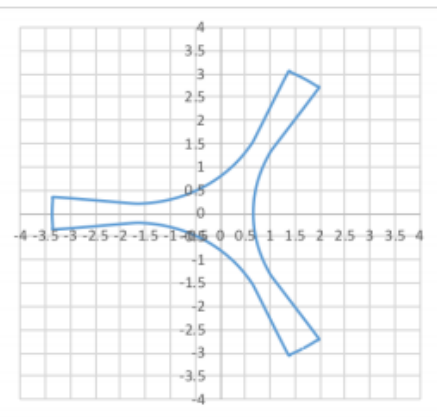
Central support: 120 deg symmetry



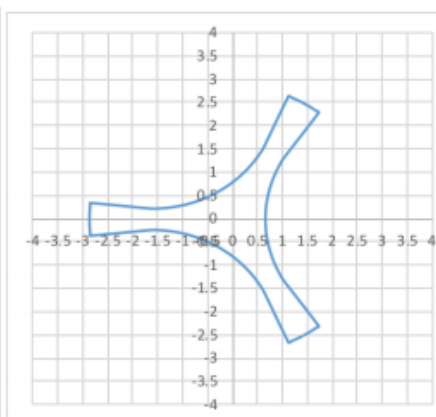
Central support: 120 deg symmetry



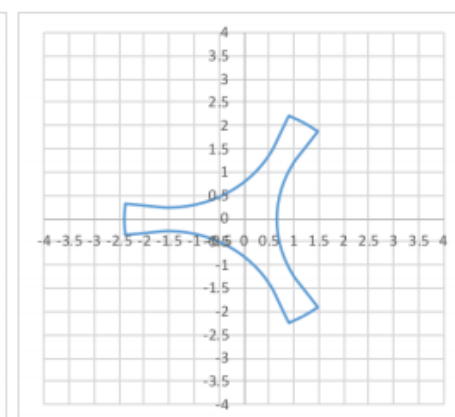
$z = 0''$



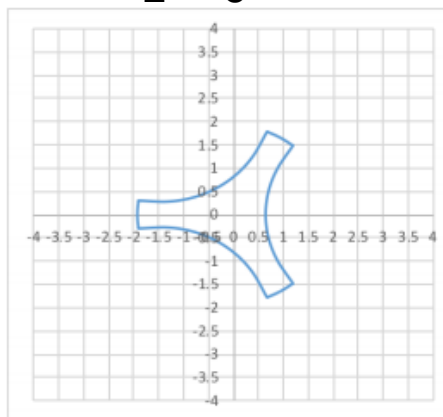
$z = 1''$



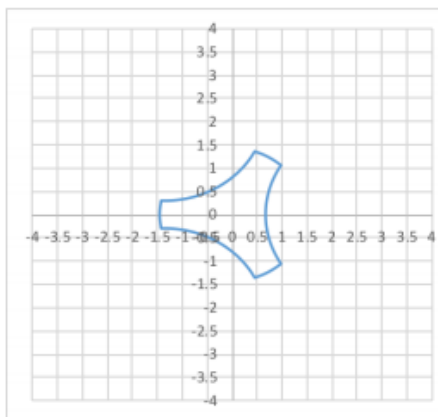
$z = 2''$



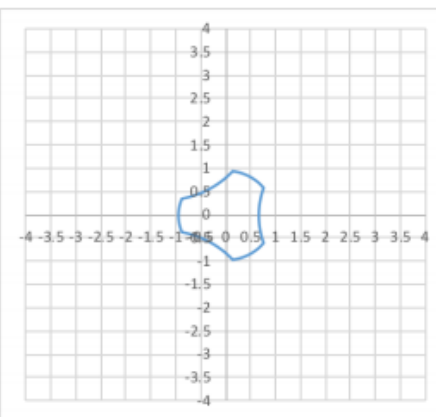
$z = 3''$



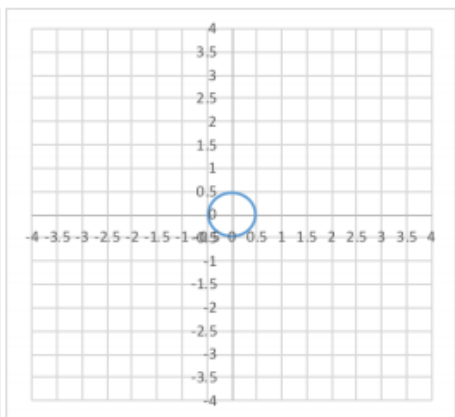
$z = 4''$



$z = 5''$



$z = 6''$



$z = 7''$

Nosecone shrouds

$$r = \{ \max \{ R_N(z) - \Delta R_w, R - \Delta x_c \}, R_N(z) \}$$

$$\phi = \{ -\phi_c(z), \phi_c(z) \}$$

$$\frac{R_N(z)}{R_{Nmax}} = \frac{z}{L_s} \left[1 - \frac{R - \Delta x_c}{R_{Nmax}} \right] + \frac{R - \Delta x_c}{R_{Nmax}}$$

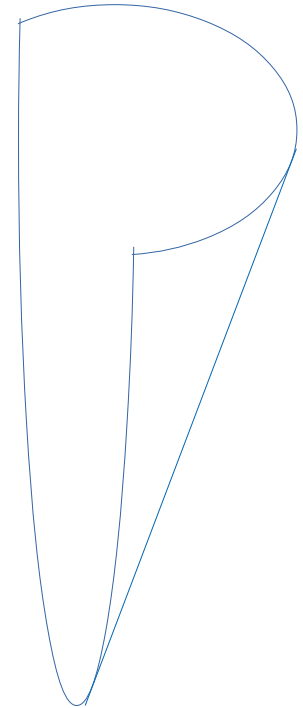
$$\phi_c(z) = \arccos \left[\frac{R^2 - r^2 - \Delta x_c^2}{2 \Delta x_c r} \right]$$

$$\Delta x_c = (2 R_{Nmax} + \Delta) / \sqrt{(3)} = (5.54 + 0.4) / \sqrt{(3)} = 3.4295 \text{ inch}$$

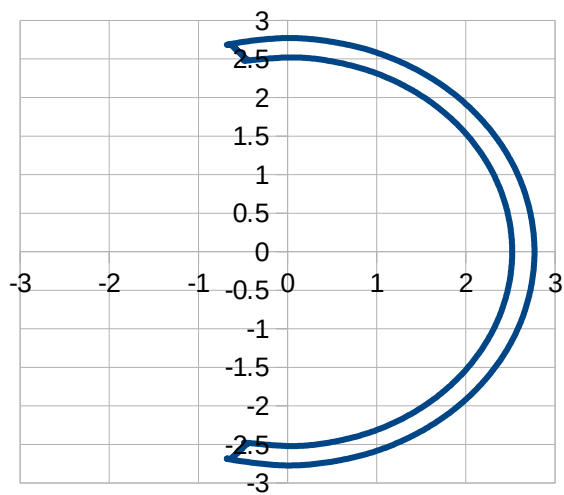
$$R_{Nmax} = 5.54 / 2 \text{ inch}$$

$$R = 7.672'' / 2$$

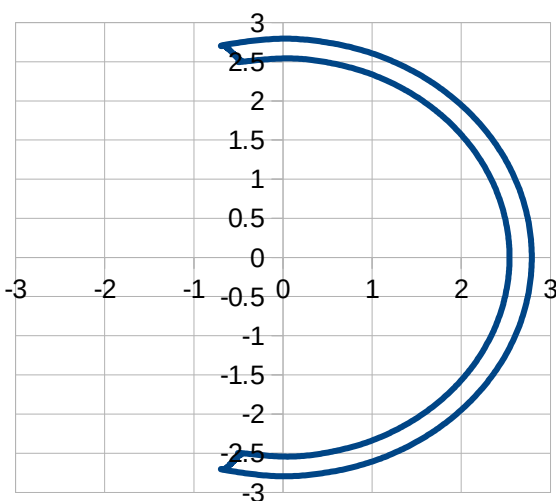
$$\Delta R_{wall} = 0.25 \text{ inch}$$



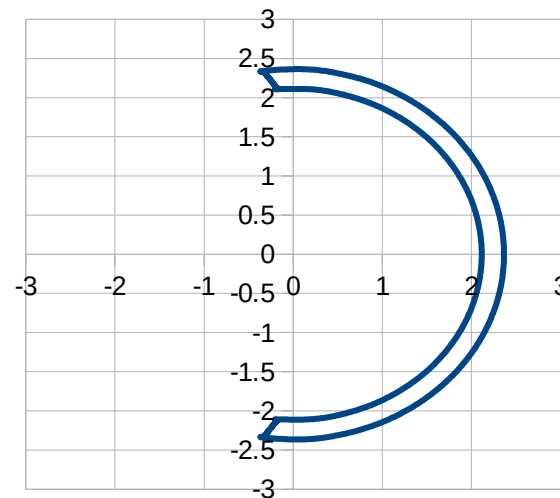
Nosecone shrouds



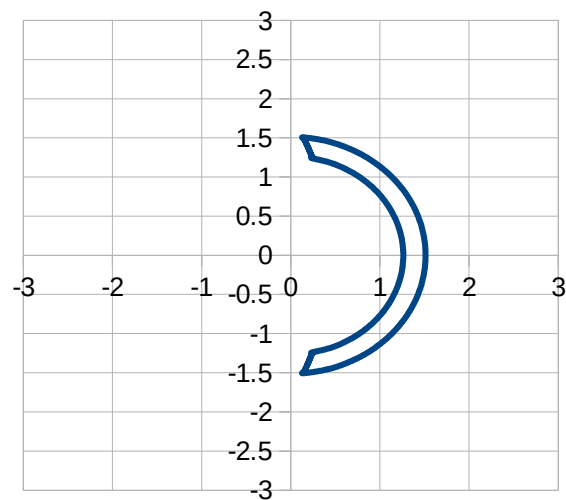
$Z = 6.5''$



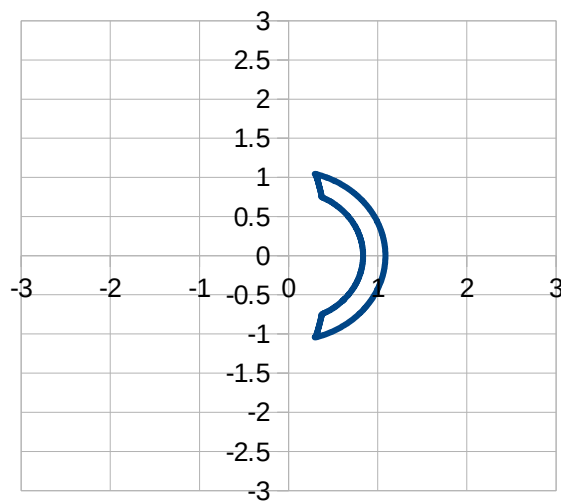
$Z = 5.5''$



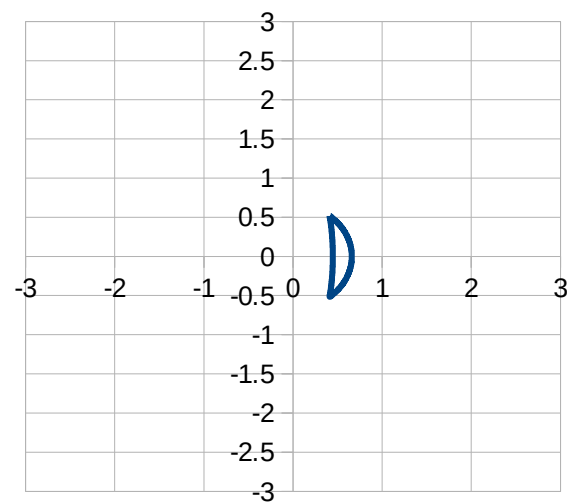
$Z = 4.5''$



$Z = 2.5''$



$Z = 1.5''$



$Z = 0.5''$