Starting with the Young-Laplace equation, we have:

$$\Delta p = -\gamma \cdot \hat{n} \tag{1.1}$$

Recognizing $\hat{n} = \vec{\nabla} f$, for the surface defined by f simplifies the previous expression to:

$$\Delta p = -\gamma \nabla^2 f$$

Expanding the previous expression yields (assume symmetry around θ):

$$\begin{aligned}\Delta p &= -\gamma\left[\frac{1}{r}\frac{\partial}{\partial r}\left(r\frac{\partial f}{\partial r}\right)+\frac{\partial^2 f}{\partial z^2}\right]\\ &= -\gamma\left[\frac{1}{r}\left(r\frac{\partial^2 f}{\partial r^2}+\frac{\partial f}{\partial r}\right)+\frac{\partial^2 f}{\partial z^2}\right]\end{aligned}$$

Which can be rewritten as:

$$\Delta p = -\gamma\left(\frac{\partial^2 f}{\partial r^2}+\frac{1}{r}\frac{\partial f}{\partial r}+\frac{\partial^2 f}{\partial z^2}\right) \tag{1.2}$$

At this point, I see the general form is comparable to the weak condition in the square droplet case: http://www.comsol.com/community/exchange/121/, which has:

$$-\mu\left[\text{test}(uTr)+\text{test}(u)/r+\text{test}(wTz)\right]$$

And I understand that I get there by integrating Eq. (1.2) by parts with the TEST function. For example, if I take the first term, what I get is:

$$\int_a^b \frac{\partial^2 f}{\partial r^2}T(r)\,dr = \text{Constants} + \int_a^b \frac{\partial f(r)}{\partial r}\frac{\partial^2 T(r)}{\partial r} = \text{More Constants} + \int_a^b f(r)\frac{\partial^2 T(r)}{\partial r}$$