(b) Sound Wave Interference

The path difference between the direct and reflected waves is $\Delta P = \sqrt{L^2 + (2d)^2} - L$. At position 1 ($d_1 = 90\,\text{m}$), there is constructive interference, so $\Delta P_1 = n\lambda$.

$$\Delta P_1 = \sqrt{120^2 + (180)^2} - 120 = \sqrt{46800} - 120 \approx 96.333\,\text{m}$$

At position 2 ($d_2 = 90 + h$), there is destructive interference for the first time. The path difference must have increased by $\lambda/2$.

$$\Delta P_2 = \Delta P_1 + \frac{\lambda}{2} = 96.333 + \frac{1.33}{2} = 97.00\,\text{m}$$

Also, $\Delta P_2 = \sqrt{120^2 + (2(90+h))^2} - 120$.

$$\sqrt{120^2 + (180 + 2h)^2} = 120 + 97.00 = 217.00$$

$$14400 + (180 + 2h)^2 = 217.00^2 = 47089$$

$$(180 + 2h)^2 = 32689$$

$$180 + 2h = \sqrt{32689} \approx 180.80$$

$$2h \approx 0.80 \implies h \approx 0.40\,\text{m}$$

Answer: The value of h is approximately $\mathbf{0.40\,m}$.