Longitudinal beta is given by[1]:

$$\beta_L = \frac{\tau|\eta|}{2\pi E_S\beta^2\nu_s} = \sqrt{-\frac{\tau\eta}{eV_0\omega_{rf}E_S\beta^2\cos\varphi_s}};\gamma_L = \frac{1}{\beta_L}$$

The bucket equation is given by[2]

$$\Delta E_b = 2\frac{\sqrt{1-\left(\frac{\pi}{2}-\varphi_s\right)\tan\varphi_s}}{\omega_{rf}\beta_L}$$

For coasting beam, this becomes[3]

$$\Delta E_b = \frac{2}{\omega_{rf}\beta_L} = \sqrt{\frac{4eV_0E_s\beta^2}{\tau|\eta|\omega_{rf}}} = \sqrt{\frac{2eV_0E_s\beta^2}{\tau|\eta|f_{rf}\pi}}$$

The required voltage will then be given by

$$\begin{aligned}
V_0 &= \left(\frac{1}{e}\right)\frac{(\Delta E_b)^2\tau|\eta|f_{rf}\pi}{2E_s\beta^2} \\
&= \left(\frac{1}{e}\right)\frac{(\Delta E_b)^2 C|\eta|f_{rf}\pi}{2cE_s\beta^3} \\
&= \left(\frac{1}{e}\right)\frac{(\Delta E_b)^2|\eta|h\pi}{2E_s\beta^2}
\end{aligned}$$

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[1] From my USPAS Longitudinal Motion Lecture, http://home.fnal.gov/~prebys/misc/uspas_2014/08-Longitudinal%20Motion%201.pptx, p. 8

[2] ibid. p. 12

[3] You can also get this from Chao and Tigner, "Accelerator Physics", 2.1.2, eq. 12, by plugging in $\phi=\phi_s=0$ and rearranging some terms.