If $\boldsymbol{P_{refl}}$ is a negative identity matrix and $\boldsymbol{P_{refl2}}$ is the identity matrix scaled by r_{refl2} as suggested in the main write-up, then $\boldsymbol{G} = -r_{refl2}\boldsymbol{N}^2$ and

$$\boldsymbol{G} = \boldsymbol{N_2^2} = -r_{refl2}\begin{bmatrix} 1 & ik_0h_2n_2^2 \\ ik_0h_2\cos^2\theta_2 & 1 \end{bmatrix}^2 = \begin{bmatrix} p_2 & -p_2 \\ 1 & 1 \end{bmatrix}(-r_{refl2})\begin{bmatrix} 1+ik_0h_2n_2\cos\theta_2 & 0 \\ 0 & 1-ik_0h_2n_2\cos\theta_2 \end{bmatrix}^2\begin{bmatrix} \frac{1}{2p_2} & \frac{1}{2} \\ \frac{-1}{2p_2} & \frac{1}{2} \end{bmatrix}$$

This is convenient because $\boldsymbol{G^L} = \boldsymbol{S}(-r_{refl2})^{\boldsymbol{L}}\boldsymbol{\Lambda^L S^{-1}}$ meaning that for any power the diagonal in the middle is just made of two binomial expansions of the form $(1 \pm ia)^{2L}$ for $a = k_0h_2n_2\cos\theta_2$. This means the full model would be (in various configurations):

$$\frac{1}{r_{refl2}}\boldsymbol{S}\left(\sum_{\boldsymbol{K=1}}^{\boldsymbol{L}}(-r_{refl2})^{\boldsymbol{K}}\boldsymbol{\Lambda^K}\right)\boldsymbol{S^{-1}}\begin{bmatrix} A_1+R_1 \\ p_1(A_1-R_1) \end{bmatrix} + \begin{bmatrix} R_1 \\ p_1R_1 \end{bmatrix} = \begin{bmatrix} R_{tot} \\ p_1R_{tot} \end{bmatrix}$$

or

$$\frac{1}{r_{refl2}}\begin{bmatrix} p_2 & -p_2 \\ 1 & 1 \end{bmatrix}\left(\sum_{K=1}^{L}(-r_{refl2})^K\begin{bmatrix} (1+ia)^{2K} & 0 \\ 0 & (1-ia)^{2K} \end{bmatrix}\right)\begin{bmatrix} \frac{A_1}{2}\left(\frac{1}{p_2}+p_1\right)+\frac{R_1}{2}\left(\frac{1}{p_2}-p_1\right) \\ \frac{A_1}{2}\left(p_1-\frac{1}{p_2}\right)-\frac{R_1}{2}\left(p_1+\frac{1}{p_2}\right) \end{bmatrix} + \begin{bmatrix} R_1 \\ p_1R_1 \end{bmatrix} = \begin{bmatrix} R_{tot} \\ p_1R_{tot} \end{bmatrix}$$

or

$$\frac{1}{r_{refl2}}\begin{bmatrix} p_2 & -p_2 \\ 1 & 1 \end{bmatrix}\left(\sum_{K=1}^{L}(-r_{refl2})^K\begin{bmatrix} (1+ia)^{2K}\left(\frac{A_1}{2}\left(\frac{1}{p_2}+p_1\right)+\frac{R_1}{2}\left(\frac{1}{p_2}-p_1\right)\right) \\ (1-ia)^{2K}\left(\frac{A_1}{2}\left(p_1-\frac{1}{p_2}\right)-\frac{R_1}{2}\left(p_1+\frac{1}{p_2}\right)\right) \end{bmatrix}\right) + \begin{bmatrix} R_1 \\ p_1R_1 \end{bmatrix} = \begin{bmatrix} R_{tot} \\ p_1R_{tot} \end{bmatrix}$$

Some other useful equations:

$$p_2 = n_2\cos\theta_2$$

$$\cos\theta_2 = \sqrt{1-\frac{n_1^2\sin^2\theta_1}{n_2^2}}$$

$$R_1 = A_1\frac{p_1-p_2}{p_1+p_2} = A_1r_1$$

$$a = k_0h_2n_2\cos\theta_2$$

$$n_2 \approx \sqrt{\varepsilon_2}$$

$$r_{refl2} = \frac{p_2-p_1}{p_1+p_2}$$