$$
\begin{aligned}
|I_1| &= \left| \int_\Omega gRu \, \mathrm{d}\Omega \right| \\
&\le C_3 \left[\int_\Omega \left(\int_a^x g(\xi, t) \, \mathrm{d}\xi \right)^2 \mathrm{d}\Omega \right]^{1/2} \times \left[\int_\Omega \left\{ u_x^2 + \frac{1}{k} \left(\int_a^x c u_t \, \mathrm{d}\xi \right)^2 \right\} \mathrm{d}\Omega \right]^{1/2} \\
&\le C_4 \left\| f \left| \widetilde{S}_{a,-}^{-1,0} W_2(\Omega, \Gamma_l) \right| \right\| \left\| |u| \overset{\circ}{\to} W_2^{\widetilde{A}}(\Omega; \Gamma_r, T) \right\| .
\end{aligned}
$$

$$
\begin{aligned}
|I_2| &= \left| \int_0^T \psi(t) \left\{ u(a, t) - \int_{\gamma(t)}^a \frac{\mathrm{d}\theta}{k(\theta, t)} \int_a^\theta c(\xi) u_t(\xi, t) \, \mathrm{d}\xi \right\} \mathrm{d}t \right| \\
&\le C_6 \left\| f \int_\Omega \left| \widetilde{S}_{a,-}^{-1,0} W_2(\Omega, \Gamma_l) \right| \right\| \left\| |u| \overset{\circ}{\to} W_2^{\widetilde{A}}(\Omega; \Gamma_r, T) \right\| .
\end{aligned}
\tag{1.3'}
$$