$$
\begin{aligned}
C_{HB} \to \hbar \Big(& \frac{1}{36} \sum_p c_{2\gamma}\, g_1^4\, LF_{3,0}[m_{\tilde{d}}^p] - \frac{1}{36} \sum_p c_{2\gamma}\, g_1^4\, LF_{4,-1}[m_{\tilde{d}}^p] - \\
& \frac{1}{6} g_1^2 c_\gamma^2 \overline{y_d}^{pr} y_d^{pr} LF_{3,0}[m_{\tilde{d}}^r] + \frac{1}{6} g_1^2 c_\gamma^2 \overline{y_d}^{pr} y_d^{pr} LF_{4,-1}[m_{\tilde{d}}^r] + \\
& \frac{1}{4} \sum_p c_{2\gamma}\, g_1^4\, LF_{3,0}[m_{\tilde{e}}^p] - \frac{1}{4} \sum_p c_{2\gamma}\, g_1^4\, LF_{4,-1}[m_{\tilde{e}}^p] - \frac{1}{2} g_1^2 c_\gamma^2 \overline{y_e}^{pr} y_e^{pr} LF_{3,0}[m_{\tilde{e}}^r] + \\
& \frac{1}{2} g_1^2 c_\gamma^2 \overline{y_e}^{pr} y_e^{pr} LF_{4,-1}[m_{\tilde{e}}^r] - \frac{1}{16} g_1^2 \left(2 c_\gamma^2 \overline{y_e}^{pr} y_e^{pr} + \sum_p c_{2\gamma}\, g_1^2\right) LF_{3,0}[m_{\tilde{l}}^p] + \\
& \frac{1}{16} \left(2 g_1^2 c_\gamma^2 \overline{y_e}^{pr} y_e^{pr} + \sum_p c_{2\gamma}\, g_1^4\right) LF_{4,-1}[m_{\tilde{l}}^p] + \\
& \frac{1}{144} g_1^2 \left(-6 c_\gamma^2 \overline{y_d}^{pr} y_d^{pr} - 6 s_\gamma^2 \overline{y_u}^{pr} y_u^{pr} + \sum_p c_{2\gamma}\, g_1^2\right) LF_{3,0}[m_{\tilde{q}}^p] + \\
& \frac{1}{144} g_1^2 \left(6 c_\gamma^2 \overline{y_d}^{pr} y_d^{pr} + 6 s_\gamma^2 \overline{y_u}^{pr} y_u^{pr} - \sum_p c_{2\gamma}\, g_1^2\right) LF_{4,-1}[m_{\tilde{q}}^p] - \\
& \frac{2}{9} \sum_p c_{2\gamma}\, g_1^4\, LF_{3,0}[m_{\tilde{u}}^p] + \frac{2}{9} \sum_p c_{2\gamma}\, g_1^4\, LF_{4,-1}[m_{\tilde{u}}^p] - \frac{2}{3} g_1^2 s_\gamma^2 \overline{y_u}^{pr} y_u^{pr} LF_{3,0}[m_{\tilde{u}}^r] + \\
& \frac{2}{3} g_1^2 s_\gamma^2 \overline{y_u}^{pr} y_u^{pr} LF_{4,-1}[m_{\tilde{u}}^r] + \frac{1}{64} \left(g_1^4 (1 + 3 c_{4\gamma}) + 3 g_1^2 g_2^2 (-1 + c_{4\gamma})\right) LF_{3,0}[m_\Phi] - \\
& \frac{1}{64} g_1^2 \left(g_1^2 (1 + 3 c_{4\gamma}) + 3 g_2^2 (-1 + c_{4\gamma})\right) LF_{4,-1}[m_\Phi] - \\
& \frac{1}{6} g_1^2 \left(c_\gamma \overline{a_d}^{pr} - s_\gamma \tilde{\mu} \overline{y_d}^{pr}\right) \left(c_\gamma a_d^{pr} - s_\gamma \tilde{\mu} y_d^{pr}\right) LF_{2,2,0}[m_{\tilde{d}}^r, m_{\tilde{q}}^p] - \\
& \frac{1}{6} g_1^2 \left(c_\gamma \overline{a_d}^{pr} - s_\gamma \tilde{\mu} \overline{y_d}^{pr}\right) \left(c_\gamma a_d^{pr} - s_\gamma \tilde{\mu} y_d^{pr}\right) LF_{3,1,0}[m_{\tilde{d}}^r, m_{\tilde{q}}^p] + \\
& \frac{1}{6} g_1^2 \left(c_\gamma \overline{a_d}^{pr} - s_\gamma \tilde{\mu} \overline{y_d}^{pr}\right) \left(c_\gamma a_d^{pr} - s_\gamma \tilde{\mu} y_d^{pr}\right) LF_{3,2,-1}[m_{\tilde{d}}^r, m_{\tilde{q}}^p] + \\
& \frac{1}{6} g_1^2 \left(c_\gamma \overline{a_d}^{pr} - s_\gamma \tilde{\mu} \overline{y_d}^{pr}\right) \left(c_\gamma a_d^{pr} - s_\gamma \tilde{\mu} y_d^{pr}\right) LF_{4,1,-1}[m_{\tilde{d}}^r, m_{\tilde{q}}^p] - \\
& \frac{1}{2} g_1^2 \left(c_\gamma \overline{a_e}^{pr} - s_\gamma \tilde{\mu} \overline{y_e}^{pr}\right) \left(c_\gamma a_e^{pr} - s_\gamma \tilde{\mu} y_e^{pr}\right) LF_{2,2,0}[m_{\tilde{e}}^r, m_{\tilde{l}}^p] - \\
& \frac{1}{2} g_1^2 \left(c_\gamma \overline{a_e}^{pr} - s_\gamma \tilde{\mu} \overline{y_e}^{pr}\right) \left(c_\gamma a_e^{pr} - s_\gamma \tilde{\mu} y_e^{pr}\right) LF_{3,1,0}[m_{\tilde{e}}^r, m_{\tilde{l}}^p] + \\
& \frac{1}{2} g_1^2 \left(c_\gamma \overline{a_e}^{pr} - s_\gamma \tilde{\mu} \overline{y_e}^{pr}\right) \left(c_\gamma a_e^{pr} - s_\gamma \tilde{\mu} y_e^{pr}\right) LF_{3,2,-1}[m_{\tilde{e}}^r, m_{\tilde{l}}^p] + \\
& \frac{1}{2} g_1^2 \left(c_\gamma \overline{a_e}^{pr} - s_\gamma \tilde{\mu} \overline{y_e}^{pr}\right) \left(c_\gamma a_e^{pr} - s_\gamma \tilde{\mu} y_e^{pr}\right) LF_{4,1,-1}[m_{\tilde{e}}^r, m_{\tilde{l}}^p] + \\
& \frac{1}{2} g_1^2 \left(c_\gamma \overline{a_e}^{pr} - s_\gamma \tilde{\mu} \overline{y_e}^{pr}\right) \left(c_\gamma a_e^{pr} - s_\gamma \tilde{\mu} y_e^{pr}\right) LF_{3,2,-1}[m_{\tilde{l}}^p, m_{\tilde{e}}^r] - \\
& \frac{1}{4} g_1^2 \left(c_\gamma \overline{a_e}^{pr} - s_\gamma \tilde{\mu} \overline{y_e}^{pr}\right) \left(c_\gamma a_e^{pr} - s_\gamma \tilde{\mu} y_e^{pr}\right) LF_{4,1,-1}[m_{\tilde{l}}^p, m_{\tilde{e}}^r] + \\
& \frac{1}{4} g_1^2 \left(c_\gamma \overline{a_e}^{pr} - s_\gamma \tilde{\mu} \overline{y_e}^{pr}\right) \left(c_\gamma a_e^{pr} - s_\gamma \tilde{\mu} y_e^{pr}\right) LF_{5,1,-2}[m_{\tilde{l}}^p, m_{\tilde{e}}^r] + \\
& \frac{1}{3} g_1^2 \left(c_\gamma \overline{a_d}^{pr} - s_\gamma \tilde{\mu} \overline{y_d}^{pr}\right) \left(c_\gamma a_d^{pr} - s_\gamma \tilde{\mu} y_d^{pr}\right) LF_{3,1,0}[m_{\tilde{q}}^p, m_{\tilde{d}}^r] + \\
& \frac{1}{6} g_1^2 \left(c_\gamma \overline{a_d}^{pr} - s_\gamma \tilde{\mu} \overline{y_d}^{pr}\right) \left(c_\gamma a_d^{pr} - s_\gamma \tilde{\mu} y_d^{pr}\right) LF_{3,2,-1}[m_{\tilde{q}}^p, m_{\tilde{d}}^r] - \\
& \frac{13}{12} g_1^2 \left(c_\gamma \overline{a_d}^{pr} - s_\gamma \tilde{\mu} \overline{y_d}^{pr}\right) \left(c_\gamma a_d^{pr} - s_\gamma \tilde{\mu} y_d^{pr}\right) LF_{4,1,-1}[m_{\tilde{q}}^p, m_{\tilde{d}}^r] + \\
& \frac{3}{4} g_1^2 \left(c_\gamma \overline{a_d}^{pr} - s_\gamma \tilde{\mu} \overline{y_d}^{pr}\right) \left(c_\gamma a_d^{pr} - s_\gamma \tilde{\mu} y_d^{pr}\right) LF_{5,1,-2}[m_{\tilde{q}}^p, m_{\tilde{d}}^r] - \\
& \frac{1}{24} g_1^2 \left(s_\gamma \overline{a_u}^{pr} - \tilde{\mu} c_\gamma \overline{y_u}^{pr}\right) \left(s_\gamma a_u^{pr} - \tilde{\mu} c_\gamma y_u^{pr}\right) LF_{2,2,0}[m_{\tilde{q}}^p, m_{\tilde{u}}^r] - \\
& \frac{1}{24} g_1^2 \left(s_\gamma \overline{a_u}^{pr} - \tilde{\mu} c_\gamma \overline{y_u}^{pr}\right) \left(s_\gamma a_u^{pr} - \tilde{\mu} c_\gamma y_u^{pr}\right) LF_{3,1,0}[m_{\tilde{q}}^p, m_{\tilde{u}}^r] + \\
& \frac{1}{24} g_1^2 \left(s_\gamma \overline{a_u}^{pr} - \tilde{\mu} c_\gamma \overline{y_u}^{pr}\right) \left(s_\gamma a_u^{pr} - \tilde{\mu} c_\gamma y_u^{pr}\right) LF_{3,2,-1}[m_{\tilde{q}}^p, m_{\tilde{u}}^r] + \\
& \frac{1}{24} g_1^2 \left(s_\gamma \overline{a_u}^{pr} - \tilde{\mu} c_\gamma \overline{y_u}^{pr}\right) \left(s_\gamma a_u^{pr} - \tilde{\mu} c_\gamma y_u^{pr}\right) LF_{4,1,-1}[m_{\tilde{q}}^p, m_{\tilde{u}}^r] - \\
& \frac{7}{24} g_1^2 \left(s_\gamma \overline{a_u}^{pr} - \tilde{\mu} c_\gamma \overline{y_u}^{pr}\right) \left(s_\gamma a_u^{pr} - \tilde{\mu} c_\gamma y_u^{pr}\right) LF_{3,1,0}[m_{\tilde{u}}^r, m_{\tilde{q}}^p] + \\
& \frac{1}{24} g_1^2 \left(s_\gamma \overline{a_u}^{pr} - \tilde{\mu} c_\gamma \overline{y_u}^{pr}\right) \left(s_\gamma a_u^{pr} - \tilde{\mu} c_\gamma y_u^{pr}\right) LF_{3,2,-1}[m_{\tilde{u}}^r, m_q^p] - \\
& \frac{11}{24} g_1^2 \left(s_\gamma \overline{a_u}^{pr} - \tilde{\mu} c_\gamma \overline{y_u}^{pr}\right) \left(s_\gamma a_u^{pr} - \tilde{\mu} c_\gamma y_u^{pr}\right) LF_{4,1,-1}[m_{\tilde{u}}^r, m_{\tilde{q}}^p] + \\
& \frac{3}{4} g_1^2 \left(s_\gamma \overline{a_u}^{pr} - \tilde{\mu} c_\gamma \overline{y_u}^{pr}\right) \left(s_\gamma a_u^{pr} - \tilde{\mu} c_\gamma y_u^{pr}\right) LF_{5,1,-2}[m_{\tilde{u}}^r, m_{\tilde{q}}^p] - \\
& \frac{1}{8} g_1^4 \left(c_\gamma^2 + s_\gamma^2\right) LF_{3,1,-1}[\tilde{\mu}, m_1] - \frac{1}{4} m_1 s_\gamma \tilde{\mu} c_\gamma g_1^4 LF_{3,1,0}[\tilde{\mu}, m_1] + \\
& \frac{3}{8} g_1^4 \left(c_\gamma^2 + s_\gamma^2\right) LF_{4,1,-2}[\tilde{\mu}, m_1] + \frac{1}{2} m_1 s_\gamma \tilde{\mu} c_\gamma g_1^4 LF_{4,1,-1}[\tilde{\mu}, m_1] - \\
& \frac{1}{4} g_1^4 \left(c_\gamma^2 + s_\gamma^2\right) LF_{5,1,-3}[\tilde{\mu}, m_1] - \frac{1}{2} m_1 s_\gamma \tilde{\mu} c_\gamma g_1^4 LF_{5,1,-2}[\tilde{\mu}, m_1] - \\
& \frac{3}{8} g_1^2 g_2^2 \left(c_\gamma^2 + s_\gamma^2\right) LF_{3,1,-1}[\tilde{\mu}, m_2] - \frac{3}{4} m_2 s_\gamma \tilde{\mu} c_\gamma g_1^2 g_2^2 LF_{3,1,0}[\tilde{\mu}, m_2] + \\
& \frac{9}{8} g_1^2 g_2^2 \left(c_\gamma^2 + s_\gamma^2\right) LF_{4,1,-2}[\tilde{\mu}, m_2] + \frac{3}{2} m_2 s_\gamma \tilde{\mu} c_\gamma g_1^2 g_2^2 LF_{4,1,-1}[\tilde{\mu}, m_2] - \\
& \frac{3}{4} g_1^2 g_2^2 \left(c_\gamma^2 + s_\gamma^2\right) LF_{5,1,-3}[\tilde{\mu}, m_2] - \frac{3}{2} m_2 s_\gamma \tilde{\mu} c_\gamma g_1^2 g_2^2 LF_{5,1,-2}[\tilde{\mu}, m_2] \Big)
\end{aligned}
$$