The form $dz_1 \wedge dz_2$ extends to a meromorphic 2-form on $\mathbb{P}^2$; since $K_{\mathbb{P}^2} = -3H$ and $dz_1 \wedge dz_2$ is nonzero holomorphic on $\mathbb{P}^2 - L$, it follows that $dz_1 \wedge dz_2$ must have a pole of order 3 along the line L.

⌈ $\mathbb{P}^2$. $U_0 = (Z_0 \neq 0)$ $U_1 = (Z_1 \neq 0)$ $U_2 = (Z_2 \neq 0)$.

$$\sigma_0 = dz_1 \wedge dz_2$$

$$= d\frac{1}{x_0} \wedge d\frac{x_2}{x_0}. \quad \text{where } \frac{1}{x_0} = \left(\frac{Z_0}{Z_1}\right)^{-1} = z_1$$

$$\frac{x_2}{x_0} = \frac{Z_2}{Z_0} = \left(\frac{Z_2}{Z_0}\right) \Big/ \left(\frac{Z}{Z}\right)$$

$$\Rightarrow \quad dz_1 \wedge dz_2 = d\left(\frac{1}{x_0}\right) \wedge d\left(\frac{x_2}{x_0}\right) = \left(-\frac{1}{x_0^2}dx_0\right) \wedge \left(-\frac{x_2}{x_0^2}dx_0 + \frac{1}{x_0}dx_2\right) = -\frac{1}{x_0^3}dx_0 \wedge dx_2.$$

$\Rightarrow$ σ_0 extends to U_1, and eventually to $\mathbb{P}^2$. The rest follows easily. ⌋

Similarly, f extends to a meromorphic function on $\mathbb{P}^2$, and since f is a polynomial with a single zero along a curve of degree d in $\mathbb{P}^2 - L$, it must have a pole of order d along L.

⌈ $f(z_1, z_2) = f\left(\frac{Z_1}{Z_0}, \frac{Z_2}{Z_0}\right) = f\left(\frac{1}{x_0}, \frac{x_2}{x_0}\right)$

$\Rightarrow$ f can be extended to $\mathbb{P}^2$.

Note that, when we write ω locally as follows

$$\omega = \frac{g(z_1, z_2)}{f(z_1, z_2)} dz_1 \wedge dz_2,$$

f is the function mentioned before, i.e $f\left(\frac{Z_1}{Z_0}, \frac{Z_2}{Z_0}\right) = F\left(1, \frac{Z_1}{Z_0}, \frac{Z_2}{Z_0}\right)$.