Since the Schubert cycle $\sigma_{2,1}(p, h) \subset G$ has intersection number 1 with the hyperplane class σ_1, it follows that

Every Schubert cycle $\sigma_{2,1}(p, h) \subset G$ is a line in $\mathbb{P}^5$.

⌈ By P746, $\sigma_{2,1} \cdot \sigma_1 = 1$.
$\#(\sigma_{2,1} \cap \sigma_1) = \#(\sigma_{2,1} \cap (G \cap H)) = \#(\sigma_{2,1} \cap H) = 1$
$\Rightarrow$ $\deg \sigma_{2,1} = 1$ in $\mathbb{P}^5$ $\Rightarrow$ $\sigma_{2,1}$ is a line in $\mathbb{P}^5$, since codim of $\sigma_{2,1} = 3$ in $G(2,4)$. ⌋

Similarly, since

$$\sigma_1^2 \cdot \sigma_{1,1} = \sigma_1^2 \cdot \sigma_2 = 1,$$

Every Schubert cycle $\sigma_2(p)$ or $\sigma_{1,1}(h) \subset G$ is a 2-plane in $\mathbb{P}^5$.

⌈ $\sigma_1^2 \cdot \sigma_{1,1} = \sigma_1 \cdot (\sigma_1 \cdot \sigma_{1,1}) = \sigma_1 \cdot (\sigma_{2,1}) = 1$
$\sigma_1^2 \cdot \sigma_2 = \sigma_1 \cdot (\sigma_1 \cdot \sigma_2) = \sigma_1 \cdot \sigma_{2,1} = 1$.
$\sigma_1^2 \cdot \sigma_{1,1} = \#((G \cap H) \cap (G \cap H') \cap \sigma_{1,1}) = \#(H \cap H' \cap \sigma_{1,1})$
$= \#(\mathbb{P}^3 \cap \sigma_{1,1}) = 1$ $\Rightarrow$ $\deg \sigma_{1,1} = 1$ $\Rightarrow$ $\sigma_{1,1}$ is a linear subspace of $\mathbb{P}^5$ by the result on p174. $\Rightarrow$
Since $\dim \sigma_{1,1} = 2$, $\sigma_{1,1} = \mathbb{P}^2$. Similarly, $\sigma_2 = \mathbb{P}^2$. ⌋

To prove the converse of the last two statements,