The Photographic Footprint of a Camera on a Drone

variables		
xsensor	36	width of sensor in mm
ysensor	24	height of sensor in mm
focallen	50	focal length of lens in mm
altitude	100	height in m
xgimbal	30	x-axis gimbal angle
ygimbal	30	y-axis gimbal angle

Field of view wide: $2\tan^{-1}\left(\frac{36}{2\times 50}\right) = 39.6°$

Field of view tall: $2\tan^{-1}\left(\frac{24}{2\times 50}\right) = 26.99°$

From drone to bottom of picture: $100 \times \tan\left(30 - \frac{1}{2}\times 39.6\right) = 17.99m$

From drone to top of picture: $100 \times \tan\left(30 + \frac{1}{2}\times 39.6\right) = 118.33m$

From drone to left of picture: $100 \times \tan\left(30 - \frac{1}{2}\times 26.99\right) = 29.63m$

From drone to right of picture: $100 \times \tan\left(30 + \frac{1}{2}\times 26.99\right) = 94.88m$

Height of photo footprint: $94.88 - 29.63 = 65.25m$

Width of photo footprint: $118.33 - 17.99 = 100.33m$