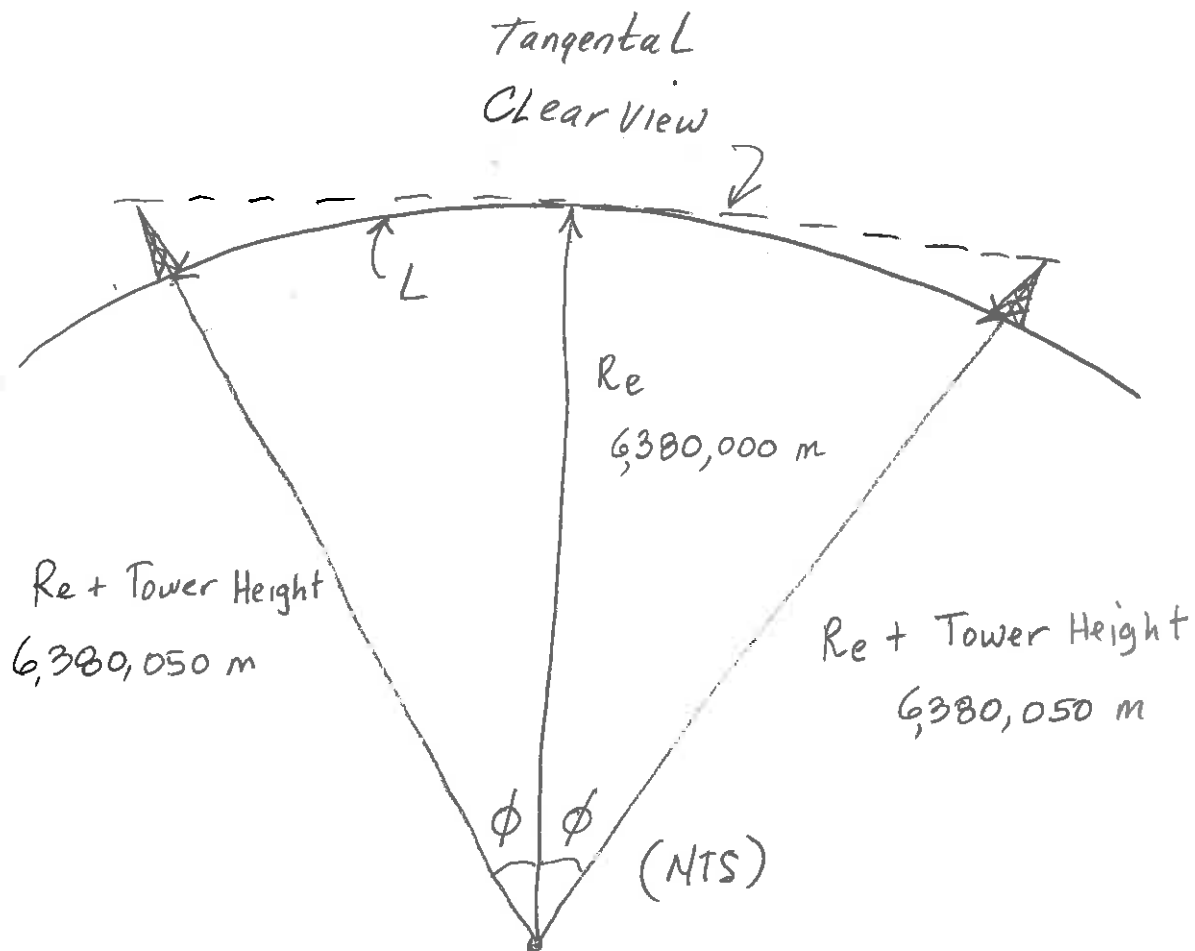


$$R_e = 6,380,000 \quad \text{tower} = 50 \quad R_e + \text{Tower} = 6,380,050$$



$$\cos \phi = \frac{6,380,000}{6,380,050} \quad \therefore \cos^{-1} \frac{6,380,000}{6,380,050} = \phi$$

$$\phi = 0.227^\circ \quad \text{but we need } 2\phi \rightarrow 0.454^\circ$$

$$\text{Calculate the surface distance } L = \frac{\phi \pi R_e}{180}$$

$$L = \frac{(0.454)(3.14)(6380)}{180} = \boxed{50.49 \text{ Km}}$$