R.H.L for $x=0$

$$\lim_{x\to 0^+} \frac{\tan^2\{x\}}{x^2-[x]^2} = \lim_{x\to 0^+} \frac{\tan^2(x-[x])}{x^2-[x]^2}$$

$$= \lim_{h\to 0} \frac{\tan^2(0+h-[0+h])}{(0+h)^2-[0+h]^2}$$

$$\Rightarrow \lim_{h\to 0} \frac{\tan^2(h-0)}{h^2-0} = \lim_{h\to 0} \left(\frac{\tan h}{h}\right)^2 = \boxed{1}$$

[Note: $[0+h]=0$, $[0-h]=-1$]

L.H.L

$$\lim_{x\to 0^-} \sqrt{(x-[x])\cot(x-[x])}$$

$$\Rightarrow \lim_{h\to 0} \sqrt{((0-h)-[0-h])\cot((0-h)-[0-h])}$$

$$\Rightarrow \lim_{h\to 0} \sqrt{(-h+1)\cos(-h+1)} = \boxed{\sqrt{\cot 1}} \neq \text{R.H.L}$$

$\therefore \lim_{x\to 0} f(x)$ Doesn't exist

hence

$\cot^{-1}\{\lim_{x\to 0} f(x)\}^2$ Does not exist