Let A be a closed subset of $\mathbb{R}^n$ and let B be the set of all those points $b \in \mathbb{R}^n$ for which there exists exactly one point $a_0 \in A$ such that

$$|a_0 - b| = \inf_{a \in A} |a - b|.$$

Prove that B is dense in $\mathbb{R}^n$; that is, the closure of B is $\mathbb{R}^n$.