Abstract. Let \( \mathcal{A} \) be a \( C^* \)-algebra with real rank zero which has the stable weak cancellation property. Let \( \mathcal{I} \) be an ideal of \( \mathcal{A} \) such that \( \mathcal{I} \) is stable and satisfies the corona factorization property. We prove that

\[
0 \to \mathcal{I} \to \mathcal{A} \to \mathcal{A}/\mathcal{I} \to 0
\]

is a full extension if and only if the extension is stenotic and \( K \)-lexicographic. As an immediate application, we extend the classification result for graph \( C^* \)-algebras obtained by Tomforde and the first named author to the general non-unital case. In combination with recent results by Katsura, Tomforde, West and the first author, our result may also be used to give a purely \( K \)-theoretical description of when an essential extension of two simple and stable graph \( C^* \)-algebras is again a graph \( C^* \)-algebra.