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GNS type representations of real locally  $C^*$ -algebras in real and complex locally Hilbert spaces are constructed, and then, as a corollary, a result on the extensions of saturated separating families of regular seminorms on real locally  $C^*$ -algebras to saturated separating families of regular seminorms on their enveloping locally  $C^*$ -algebras is obtained. (Received June 29, 2011)