Single vortex pinning and penetration depth in superconducting NdFeAsO$_{1-x}$F$_x$. JESSIE T. ZHANG, Massachusetts Institute of Technology, JEEHOON KIM, MAGDALENA HUEFNER, Harvard University, CUN YE, Tsinghua University, STELLA KIM, PAUL CANFIELD, RUSLAN PROZOROV, Iowa State University, OPHIR M. AUSLAENDER, Technion - Israel Institute of Technology, JENNIFER E. HOFFMAN, Harvard University — We use a magnetic force microscope (MFM) to investigate single vortex pinning and penetration depth in NdFeAsO$_{1-x}$F$_x$, one of the highest-$T_c$ iron-based superconductors. In fields up to 20 Gauss, we observe a disordered vortex arrangement, implying that the pinning forces are stronger than the vortex-vortex interactions. By manipulating the vortices using the MFM tip, we obtain single vortex depinning forces for vortices in NdFeAsO$_{1-x}$F$_x$. Moreover, our MFM measurements allow the first local and absolute measurement of the superconducting penetration depth in NdFeAsO$_{1-x}$F$_x$ to nanometer scale resolution.