Purpose: It has been evaluated that XVMC and BEAMnrc codes are suitable for dose calculation in patient. However, required accuracy of the codes at extended distance under scattering media is challenging. Furthermore, there is a growing importance of dose validation of complicated radiation therapy by exit dosimetry and dose reconstruction. Therefore, the purpose for this study is to predict the exit EPID images under phantom using XVMC simulation and compare them with ion chamber measurements and BEAMnrc calculation. Methods: For this study XVMC and BEAMnrc/DOSXYZnrc beam simulation algorithms were used to model a 6 MV Varian linear accelerator. The dose profiles at 150 cm were calculated under solid water flat phantoms that were isocentrically placed. Water phantom thicknesses were variable from 10 to 20 cm. On exit plane of calculation, a 2 cm-thick build up phantom and a 5-cm thick backscattering phantom were placed. The results were compared to PTW ion chamber measurements for various field sizes. Results: The XVMC and BEAMnrc simulation results were agreeable with the ion chamber reference exit dose measurements. The XVMC and BEAMnrc beam profile were in agreement in terms of dose profile for various field sizes and penumbras. The Monte Carlo results were within 3% dose difference within 80% of each field size. Conclusions: Calculations were done to predict the exit dose images using XVMC simulation and BEAMnrc calculation for various field sizes and phantom depth. When these were compared to a reference ion chamber the calculations were in agreement. The study shows that XVMC and BEAMnrc are applicable to predict EPID images at EPID depth.