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In this work we consider a class of stochastic parabolic equations with singular space depending potential, random driving force and random initial condition. For the analysis of these equations we combine the chaos expansion method from the white noise analysis and the concept of very weak solutions. For given stochastic parabolic equation we introduce the notion of a stochastic very weak solution, prove the existence and uniqueness of the very weak solution to corresponding stochastic initial value problem and show its independence of a regularization on given singular potential. In addition, the consistency of a stochastic very weak solution with a stochastic weak solution is shown.

