This study was aimed to determine the strength of the reinforced concrete and to reveal the reinforcement effect on the concrete strength by Ultrasonic P and S wave velocities. Studies were conducted with prepared 9 different concrete designs of showing low, medium and high strength features. 4 kinds of cubic samples which unreinforced and including 10, 14 or 20mm diameter reinforcement were prepared for these designs. Studies were carried out on total 324 samples including 9 samples for each design of these 4 kinds. The prepared samples of these designs were subjected to water curing. On some days of the 90-days period, P- and S-wave measurements were repeated to reveal the changes in seismic velocities of samples depending on whether reinforced or unreinforced of samples and diameter of reinforcement. Besides, comparisons were done by performing uniaxial compressive strength test with crushing of 3 samples on 7th, 28th and 90th days. As a result of studies and evaluations, it was seen that values of seismic velocities and uniaxial compressive strength increased depending on reinforcement and diameter of reinforcement in low strength concretes. However, while the seismic velocities were not markedly affected from reinforcement or reinforcement diameter in high strength concrete, uniaxial compressive strength values were negatively affected.