This study focused on evaluating the effects of blended fly ash on mechanical properties and durability of concrete. In this investigation two reference mixtures were used. One was a mixture without fly ash, and the other contained 35% ASTM Class C fly ash. Additional mixtures were composed of three blends of ASTM Class C and Class F fly ash while maintaining a total fly ash content of 40% of the total cementitious materials. Mechanical properties such as compressive strength, tensile strength, flexural strength, and modulus of elasticity were determined. Durability related properties determined were: drying shrinkage, abrasion resistance, salt scaling resistance, and electrical prediction of chloride ion penetration. The results showed that blending of Class C fly ash with Class F fly ash showed either comparable or better results than either the reference mixture without fly ash or the unblended Class C fly ash. Blending of fly ash, therefore, leads to comparable or better quality and reduced cost, due to the use of Class F versus Class C fly ash in concrete.