The penetration of chloride-ions from deicing salts into the portland cement concrete of bridge decks can cause corrosion and serious damage to the reinforcing steel. Concrete properties which prevent chloride penetration into the bridge deck and provide a good structural and economic wearing surface are desirable. A variety of mix designs have been tried in the past in search of improved performance and lower costs for bridge deck overlay concrete. A group of mixes with various designs have been tested in this project and results are being compared to determine which concrete mix appears to be the most cost effective and resistant to chloride penetration for bridge deck overlay use.