Improving resistance of high strength concrete (HSC) bridge beams to frost and defrosting salt attack by application of hydrophobic agent

Jiri Kolisko[1], Lukáš Balík [1], Michaela Kostelecka[1] and Petr Pokorný[1]

[1]Klokner institute, CTU in Prague, Solinova 7, Prague 6, 16608, Czech Republic

E-mail: jiri.kolisko@cvut.cz

Abstract. HSC (High Strength Concrete) is increasingly used for bearing bridge structures nowadays. Bridge structures in the Czech Republic are exposed to severe conditions in winter time and durability of the concrete is therefore a crucial requirement. The high strength and low water absorption of HSC suggests that the material will have high durability. However, the situation may not be so straightforward. We carried out a study of the very poor durability of HSC concrete C70/85 used to produce prestresed beams 37.1 m in length to build a 6-span highway bridge. After the beams were cast, a production control test indicated some problems with the durability of the concrete. There was a danger that 42 of the beams would not be suitable for use. All participants in the bridge project finally decided, after extensive discussions, to attempt to improve the durability of the concrete by applying a hydrophobic agent. Paper will present the results of comparative tests of four hydrophobic agents in order to choose one for real application and describes this application on construction site.