**ABSTRACT**

Ultra High Performance Concrete (UHPC) is one of the newer and superior classes of concrete that can be used to develop improved bridges capable of meeting the present and future traffic, environmental, maintenance and economical requirements. Developing on the superior material properties of UHPC, the research discussed herein studies the behavior of UHPC when used as a bridge girder material. Four optimized girders have been cast and studied for various early age as well as long term properties such as early age shrinkage, transfer length, creep behavior and shrinkage under steam treatment.

Data has been recorded through vibrating wire gages installed at strategic locations within each girder before they are cast. While the shrinkage and creep observed are very low which is characteristic of UHPC, various other aspects such as shrinkage being closely tied to formwork restraint and temperature and the prestress transfer being dependent on the girder geometry and strand pattern have been discussed. From the results we can conclude that UHPC is a promising bridge building material and with further research can be extensively employed for developing bridges.