The quality of aggregates used in concrete bridge construction can significantly reduce the service life of the structure. Aggregate quality is assessed by several methods, including Petrographic Analysis. A supplementary index of an aggregate’s quality is the Petrographic Number (PN), a numeric value calculated on the basis of the quality of various quality aggregate material present in an aggregate sample. This PN is used by the department as a partial basis for acceptance of a concrete coarse aggregate. However, currently testing methods to derive PN’s have resulted in inconsistent results.

A review of current procedures employed in doing the Petrographic Analysis was initiated to attempt to resolve the inconsistencies, and to improve the application and use of the PN as a basis for judging a coarse aggregate’s quality for use in bridge projects. This report describes the review process and the supplementary work by local engineering consultants (AGRA Earth & Environmental Limited and EBA Engineering Consultants Ltd.) and the Alberta Research Council.

This review resulted in changes to the petrographic test methods and revision to the department’s bridge concrete specification. These changes should be monitored to ensure that variances with PN’s are within acceptable limits.