

Technical Guidelines for QM-C

General Information

QM-C is defined as Quality Management Concrete. QM-C is the design, testing, placement, and monitoring of a Portland cement concrete mixture by a contractor in partnership with the owner for the purpose of making a superior product while promoting innovation and understanding.

The Iowa DOT requires QM-C on large paving projects greater than 50,000 square yards. The mix design is based on an optimized gradation, usually requiring three aggregates of coarse, intermediate, and fine (sand) sizes. QM-C mixes are designed for use in slip-form paving operations only. The optimized gradation allows easier slip-form placement without edge slump, especially on pavements with thicker pavement section (such as interstate pavements of 12"). The QM-C mix design is typically coarser than Class C mix design and typically is not suitable for handwork placement. The QM-C supplemental specifications require Class C concrete for handwork.

To produce the optimized gradation on QM-C projects, typically three aggregates are required. Many ready mix producers do not have the capability to handle more than two aggregates, thus, it is usually not feasible to require QM-C on urban projects or smaller projects that would utilize ready mix.

Since the contractor incurs costs of mix design, grade testing, and more coarse aggregate on QM-C mix designs, Class C concrete may be more economical on smaller projects, urban projects, and projects requiring staging. Class C concrete will perform equally well as the QM-C mix design and is sometimes better suited for certain placements and field situations.

Design Issues

Once it has been determined that a project will be QM-C, the next step is to identify which paving quantities to include in the QM-C items. Typically all mainline quantities including turn lanes and paved crossovers should be included in the QM-C items. Also, all ramps, including returns should be included. Quantities that should not be included in the QM-C item would be side roads of a different thickness and side roads of the same thickness, but with small quantities (less than 1000 squares per location) that would not be conducive to slip form paving. Side road quantities of the same thickness as main line with at least 1000 squares per location should also be included with the QM-C quantities.

Inspection Issues

The biggest misconception of using the QM-C specification is that the contracting authority does not have to do as much inspection and testing since the contractor performs some of those functions. This is not true. From the standpoint of inspection and testing, the contracting authority has the same responsibilities on a QM-C project as they would on a non-QM-C project. The contractor's test results are simply quality or process control unless verified by the contracting authority. So it is very important that those agency tests be performed. If verification testing is not performed on a project, there is a chance that funding could be withheld from the project. IM 530 describes the testing required by the contracting agency.