

Minneapolis Combo System for High Performance Concrete Construction

Weather related problems affecting both construction and long term durability in the Minneapolis area led to the initial exploration and later development of the Minneapolis Combo System. The initial goal was merely to design a concrete mix that would provide long term resistance to corrosion. As the development process continued, the goals expanded to include reliable pumpability, ease of consolidation, improved finishing, reduced post-tensioning time and faster curing, in both normal and severe conditions. The system incorporates non-proprietary materials, including microsilica and calcium nitrite corrosion inhibitor, but goes beyond materials to a team approach for implementation. Development of new specifications and procedures then allowed the benefits of the materials to be fully realized. The new system made demands on owners, designers, suppliers, contractors and craftsmen. It was clear to all members of the team that each stood to benefit from successful implementation: lower life-cycle costs and longer project design life for the owner; materials exceeding specifications for the designers; less delay due to weather and post-tensioning for the contractors and craftsmen, and somewhat greater material sales for the suppliers. This new approach stresses joint planning, education and even pre-construction practice of the new techniques. There are few, if any, components of the "system" which have not been used before, however, the combination of materials and procedures has created a whole which is demonstrably greater than the sum of its parts.

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