PART 1: GENERAL

1.01 MORTAR MIX DESIGN

A. AGGREGATES: The Architect/Engineer should be aware that local aggregates have the potential for AAR (Alkali Aggregate Reaction).

1. Alkali-Silica Reaction (ASR):
   a. ASR is the most common form of alkali-aggregate reaction (AAR) in concrete; the other, much less common form, is alkali-carbonate reaction (ACR). ASR and ACR are therefore both subsets of AAR. ASR is caused by a reaction between the hydroxyl ions in the alkaline cement pore solution in the concrete and reactive forms of silica in the aggregate. A gel is produced, which increases in volume by taking up water and so exerts an expansive pressure, resulting in failure of the mortar.

2. Alkali-silica reactivity (ASR) Evaluation: (ASTM C-33, Appendix X1.2.1.3)
   a. Certain materials are known to be potentially deleteriously alkali-silica reactive (Reference ASTM C-33). Determination of the presence and quantities of these materials by petrographic examination is helpful in evaluating potential alkali reactivity.

3. Related Specifications and Information Sources:
   a. ASTM C33: Standard Guide for Concrete Aggregates
      1) Appendix X1: Methods for Evaluating Potential for Deleterious Expansion due to Alkali Reactivity of Aggregate.
   c. New York State Department of Transportation: (NYSDOT) Aggregate Source Acceptance Procedure.
   d. NYSDOT – Technical Services – Materials – Approved List; Sources of Fine and Coarse Aggregates.
B. MORTAR MIX DESIGN SUBMITTAL REQUIREMENTS

1. PRODUCT DATA:
   a. Provide product data sheets for each type of material specified in the mortar mix design. The product data is to include test data substantiating that proposed products comply with specifications.
   b. The aggregate source for sands needs to be tested and pass as per ASTM C295 Petrographic Examination of Aggregates for Concrete to determine if ASR is present, on a biennial basis.

2. MATERIAL SAMPLES
   a. Mix Design Samples: Provide each type of pointing mortar in the form of sample mortar strips, 6 inches long by ½ inch wide, set in aluminum or plastic channels.
   b. Mockups: Upon approval of Mix Design Samples an in-situ mockup is to be performed for final approval of the mortar installation. A minimum of five (5) mortar samples shall be installed in designated areas for consideration by the Design Professional and the Owner for final selection of project mortar composition, color, joint profile, and texture. Mortar samples may vary sand composition and cement color, but must comply with the overall mortar specification.