401 - CONCRETE CONSTRUCTION

401.1 DESCRIPTION

All concrete construction shall meet the requirements of Section 401 and Special Provision 07-04001-R01 of the Standard Specifications except as otherwise modified herein.

401.2 MATERIALS

a. Mix Designs

The mix designs shall be approved by the Kansas City Metro Materials Board as meeting the designation "KCMMB 4K" or "KCMMB 5K".

b. Ready-mixed Concrete

Ready-mixed concrete shall be mixed and placed in accordance with the requirements of the Standard Specifications, except that ready-mixed concrete shall be transported with agitation. All concrete shall meet the slump requirements specified. Any addition of water shall be in accordance with the KCMMB specification and prior approval of the Engineer. A diligent effort shall be made by the Contractor and the ready-mix concrete producer to deliver concrete at regular intervals, and to maintain a uniform mix throughout each concrete pour. Concrete shall be delivered at intervals frequent enough to prevent any cold joints.

c. Structural Concrete Construction

All concrete used in construction of reinforced box culverts, concrete bridges, retaining walls, and headwalls shall be classified as KCMMB 5K. The actual mixed proportions of cement, aggregates and water shall be determined by the Contractor.

d. KCMMB 4K Construction

All concrete used in construction of concrete pavement and driveways, curbs and gutters, storm sewer inlets and junction boxes, concrete inverts, aprons, collars, sidewalks, integral sidewalk retaining walls, concrete ditch liner, and median noses shall be classified as KCMMB 4K. The actual mixed proportions of cement, aggregates and water shall be determined by the Contractor.

e. Curing

Wet covering and waterproof covering shall conform to KDOT Sections 1404-1406 of the Standard Specifications. Liquid membrane-forming compound shall conform to the requirements for Type 2 White Pigmented Compound as specified in AASHTO M148. Clear liquid membrane-forming compound shall not be used.

f. Reinforcing Steel

(1) Reinforcing bars shall be in accordance with "Reinforcing Steel".

(2) Welded wire fabric shall conform to the requirements of ASTM A 185, Grade 60 and shall be supplied in sheets. Rolls shall not be used.

g. Water

Water shall be clean and free from deleterious substances.

401.3 CONSTRUCTION REQUIREMENTS

a. Placement and Curing

The Contractor shall provide 24 hours notice of his intention to place concrete to allow for adequate supervision.

Table 710-1 of the Standard Specifications shall be modified to require a minimum curing period of 5 days for Other Formed Surfaces.

b. Admixtures

KCMMB Concrete shall not be supplied with any admixtures designated as (Optional) in the Mix Design Testing Data without prior approval of the City Engineer.

Concrete admixtures will not be added to concrete after leaving the batch plant without approval of the City Engineer.

c. Forms

Forms shall be of steel or wood, free from warp and shall be sufficiently strong and rigid and securely staked and braced to obtain a finished product correct to the dimensions, lines and grades required. All forms must be cleaned and oiled before each use. In no case shall forms obstruct the waterways of the storm sewer system.

d. Special Weather Conditions

(1) Cold Weather

The Contractor shall comply fully with the provisions of ACI 306.1-90 as modified below:

(a) Average daily temperatures as defined in ACI 306.1-90 will be determined and recorded by the City Engineer.

(b) Concrete temperatures will be determined through the use of high-low thermometers placed and operated by the City below insulated blankets, or where the concrete is uncovered, by checking air temperatures. Uncovered concrete, which has been subjected to freezing temperatures of any duration during the first 24 hours will be considered "frozen," and shall be rejected.

(c) The months of December, January and February will be considered "Cold Weather" and will require concrete protection, regardless of temperature.

(d) Concrete shall reach 75% of its design strength prior to backfilling. This strength can be determined through the use of field-cured cylinders, made and tested at contractor's expense. Concrete must have 5 days where the average daily temperature is above 50 degrees F prior to backfilling unless field cured cylinders are taken. These days do not need to be consecutive.

(2) Concrete operations in hot weather shall conform to Section 401.8 (a) of the Standard Specifications.

e. Backfill

Backfill of concrete structures shall be in accordance with Section 204.3.f of the Standard Specifications.

f. Strength Acceptance Requirements

Cylinders used for determination of concrete strength shall be sampled and field cured in accordance with KT-22, and tested in accordance with ASTM C39. Testing frequency shall be in accordance with the City Sampling and Testing Frequency Chart. All KCMMB 4K concrete shall have a minimum compressive strength of 4000 psi at 28 days. All KCMMB 5K concrete shall have a minimum compressive strength of 5000 psi at 28 days. Concrete not meeting these strength requirements as determined by ACI 318-11 Section 5.6.3.3 shall be removed and replaced at the contractor's expense.

401.4 MEASUREMENT AND PAYMENT

The Engineer will measure the KCMMB 5K and KCMMB 4K structural concrete construction by the cubic yard.

Payment for "KCMMB 5K Concrete" and "KCMMB 4K Concrete" at the contract unit prices bid is full compensation for the specified work.