ITEM 421, HYDRAULIC CEMENT CONCRETE 2014 TXDOT SPECIFICATION

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Specification Philosophy

- Reduce cost without reducing Quality
- Remove TxDOT from being in the way of Concrete Supplier/Contractor Business
- Reduce rejection of good concrete

Specification Update Schedule

- Accelerated Schedule compared to last revision process
- September 2012:
  - Began initial internal discussions of potential spec changes
- June
  - Deadline for all spec to be complete
- July 1st
  - Specifications to be sent for publication
- No Deadline set – Possibly end of Summer 2013
- January 1st:
  - Projects to be let with new specification

MAJOR CHANGES

Classes of Concrete

- Type IL Cements (contain up to 15% Limestone)
  - Allowed in Non-Structural Classes of Concrete
  - Research has shown synergy with Class C fly ash
- High Performance Concrete (HPC)
- Sulfate Resistant Concrete (SRC)
  - SRC will only require moderate sulfate resistant cements
  - Type I or Type III + Class F fly ash will be considered SRC

Air Entrainment Requirements

- Air entrainment only required when shown on the plans
- No specified entrained air content
- Use of AEA limited to maximum AEA dosage
- Contractor must provide data showing that at least 3% air content is capable during trial batch
- No field testing of air content
- Aggregate requirements tied to when air entrainment is specified, not to when AEA is used.

Slump

- Modified slump table
- Job Control Test performed by the Contractor
- Use of High Slump concrete
  - Retest immediately
  - If still high, contractor has option to use load, TxDOT will make strength specimens

Mix Design Options

- Option 1:
  - 20% fly ash instead of 25% for precast concrete
- Option 8

Scenario	ASTM C 1260 Result		Testing Requirements for Mix Design Materials or Prescriptive Mix Design Options1
	Mix Design Fine Agg.	Mix Design Coarse Agg.	
A	> 0.10%	> 0.10%	• Determine the dosage of SCM's needed to limit the 14-day expansion of each aggregate2 to 0.08% when tested individually in accordance with ASTM C 1567, or • Use a minimum of 40% Class C fly ash having a maximum CaO3 content of 25%.
B	≤ 0.10%	≤ 0.10%	• Use a minimum of 40% Class C fly ash having a maximum CaO3 content of 25%, or • Use any ternary combination which replaces 35 to 50% of cement.
	≤ 0.10%	ASTM C 1293 1 yr Expansion ≤ 0.04%	• Use a minimum of 20% of any Class C fly ash, or • Use any ternary combination which replaces 35 to 50% of cement.
C	≤ 0.10%	> 0.10%	• Determine the dosage of SCM's needed to limit the 14-day expansion of coarse and intermediate2 aggregate to 0.08% when tested individually in accordance with ASTM C 1567, or • Use a minimum of 40% Class C fly ash having a maximum CaO3 content of 25%.
D	> 0.10%	≤ 0.10%	• Use a minimum of 40% Class C fly ash having a maximum CaO3 content of 25%, or • Use any ternary combination which replaces 35 to 50% of cement.
	> 0.10%	ASTM C 1293 1 yr Expansion ≤ 0.04%	• Determine the dosage of SCM's needed to limit the 14-day expansion of fine aggregate to 0.08% when tested in accordance with ASTM C 1567.

1. Do not use Class C fly ash if the ASTM C 1260 value of the fine, intermediate, or coarse aggregate is 0.30% or greater, unless the fly ash is used as part of a ternary system.
2. Intermediate size aggregates shall fall under the requirements of mix design coarse aggregate.
3. Average the CaO content from the previous ten values as listed on the mill certificate.

Concrete Trial Batches

- Trial Batches no longer required
  - Contractor must provide historical data showing proposed mix design meets requirements
  - If none exist, then trial batch is necessary
- Changes in chemical admixture dosage will not require new trial batch
- During project, trial batches will be allowed to be performed concurrently with concrete placements

Concrete Delivery Time

Fresh Concrete Temperature, °F	Max. time after batching for concrete not containing Type B or D admixtures, min.	Max. time after batching for concrete containing Type B or D admixtures1, min.
$90 \leq T \leq 95$	45	75
$75 \leq T < 90$	60	90
$T < 75$	90	120

1. Concrete must contain at least the minimum manufacturer's recommended dosage of Type B or D admixture.

- Concrete delivered after these time will be subject to slump and temperature testing. Concrete meeting slump and temperature requirements may be used.

Other Issues

- Over the past few years, we have encouraged Districts to stop requiring Class F fly ash during the months of April – October for Class P concrete
- Supply issues
  - Spring and Early Fall
- Concerns about Class F fly ash converting to Class C fly ash
  - ASR mitigation
  - Mass Placements

Questions?