APPENDIX A

Fly Ash And Slag Characterization

Client:	NCHRP	CTL Proj.No.:	186102
Project:	Processing Additions	CTL Proj.Mgr.:	P. Taylor
	Class C Fly Ash	Contact:	Dr. A. Hanna

	Mineral Admixture Class			Results
Standard Physical Requirements	N	F	C	**Class C Fly Ash**
Fineness:				
Amount retained when wet-sieved on No. 325 (45μm) sieve, max, %	34	34	34	21
Specific Gravity, g/cc	...	...	...	2.74
Strength Activity Index: [A]				
With portland cement,				
at 7 days, min, percent of control	75[B]	75[B]	75[B]	85
at 28 days, min, percent of control	75[B]	75[B]	75[B]	98
Water requirement, max, percent of control	115	105	105	95
Soundness: [C]				
Autoclave expansion or contraction, max, %	0.80	0.80	0.80	0.18

A. The strength activity index with portland cement is not to be considered a measure of the compressive strength of concrete containing the mineral admixture. For more information see note B in ASTM C 618-03, "Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolans for Use as a Mineral Admixture in Concrete."

B. Meeting the 7 or 28-day strength activity index will indicate specification compliance.

C. If the mineral admixture will constitute more than 20 % by weight of the cementitious material in the project mix design, thetest specimens for autoclave expansion shall contain that anticipated percentage. For more information see note C in ASTM C 618-03, "Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolans for Use as a Mineral Admixture In Concrete."

Client:	NCHRP	CTL Proj.No.:	186102
Project:	Processing Additions	CTL Proj.Mgr.:	P. Taylor
	Class F Fly Ash	Contact:	Dr. A. Hanna

	Mineral Admixture Class			Results
Standard Physical Requirements	N	F	C	**Class F Fly Ash**
Fineness:				
Amount retained when wet-sieved on No. 325 (45μm) sieve, max, %	34	34	34	15
Specific Gravity, g/cc	...	...	...	2.30
Strength Activity Index: [A]				
With portland cement,				
at 7 days, min, percent of control	75[B]	75[B]	75[B]	75
at 28 days, min, percent of control	75[B]	75[B]	75[B]	93
Water requirement, max, percent of control	115	105	105	97
Soundness: [C]				
Autoclave expansion or contraction, max, %	0.80	0.80	0.80	0.06

A. The strength activity index with portland cement is not to be considered a measure of the compressive strength of concrete containing the mineral admixture. For more information see note B in ASTM C 618-03, "Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolans for Use as a Mineral Admixture in Concrete."

B. Meeting the 7 or 28-day strength activity index will indicate specification compliance.

C. If the mineral admixture will constitute more than 20 % by weight of the cementitious material in the project mix design, the test specimens for autoclave expansion shall contain that anticipated percentage. For more information see note C in ASTM C 618-03, "Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolans for Use as a Mineral Admixture In Concrete."

Client: NCHRP
Project: Processing Additions
Slag

CTL Proj.No.: 186102
CTL Proj.Mgr.: P. Taylor
Contact: Dr. A. Hanna

	Slag Admixture Class			Results
Standard Physical Requirements	Grade 80	Grade 100	Grade 120	**Slag**
Fineness:				
Amount retained when wet-sieved on No. 325 (45µm) sieve, max, %	20	20	20	1.0
Specific Gravity, g/cc	...	...	...	2.93
Slag Activity Index: [A]				
at 7 days, min, percent of control	...	70	90	71
at 28 days, min, percent of control	70	90	110	95
Air Content of Slag Mortar, max, %	12	12	12	3.0
ASTM C 989-99 Standard Chemical Requirements				
Sulfide Sulfur (S), max, %	2.5	2.5	2.5	1.0
Sulfate Ion (SO_3), max, %	4.0	4.0	4.0	2.94

A. Slag activity index specifications are for individual samples only. See ASTM C 989-99 Table 1 for further information.