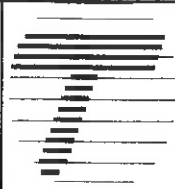


**SUPERSEDED BY**  
**EB 15-031**  
**EFFECTIVE 9/28/15**



New York State  
Department of  
Transportation  
**ENGINEERING**  
**INSTRUCTION**

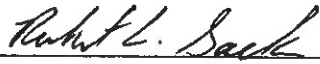
**EI**  
**08-027**

Title: **SPECIFICATION REVISIONS: SECTIONS 501 PORTLAND CEMENT CONCRETE GENERAL AND 711-11 MICROSILICA**  
**NEW SPECIFICATION: SECTION 711-14 HIGH REACTIVITY POZZOLAN**

Distribution:

<input checked="" type="checkbox"/> Manufacturers (18)	<input type="checkbox"/> Surveyors (33)
<input checked="" type="checkbox"/> Local Govt. (31)	<input checked="" type="checkbox"/> Consultants (34)
<input checked="" type="checkbox"/> Agencies (32)	<input checked="" type="checkbox"/> Contractors (39)
	<input type="checkbox"/> _____ ( )

Approved:

  
Robert L. Sack, P.E.  
Deputy Chief Engineer, Research

8 SEP 08  
Date

**ADMINISTRATIVE INFORMATION:**

This EI is effective with projects submitted for the letting of 01/08/2009.  
No issuances are superseded by this EI.

**PURPOSE:** This Engineering Instruction transmits revisions to Sections 501, and §711-11 of the Standard Specifications, and adds a new section: §711-14 HIGH REACTIVITY POZZOLAN.

**TECHNICAL INFORMATION:** The introduction of a new Standard Specification, §711-14 HIGH REACTIVITY POZZOLAN, allows the use of alternative cementitious products, which are not categorized as *Silica Fume*, *GGBFS* or *Flyash*. These alternate products may be considered for use as a substitute for Portland Cement, where enhanced pozzolanic properties are desired. With the introduction of this new specification, a new section will be added to the Department's Approved List of Materials. This new section will be entered under the category of "Concrete Admixtures; Mineral as: "711-14 HIGH REACTIVITY POZZOLAN". In addition, Section 501 is being revised to include §711-13 CALCIUM NITRITE BASED CORROSION INHIBITORS, which was introduced in EI 02-004, and currently exists in Section 711 of the Standard Specifications.

**IMPLEMENTATION:** No special provisions are necessary for the implementation of this EI. The transmitted shelf notes will be incorporated into contract proposals by the Design Quality Assurance Bureau. The Department's Approved List of Materials and Equipment will be revised to add the new section. Products which are currently listed on the Department's Approved list as "MICROSILICA (711-11)", which meet the new AASHTO standard M 321, but do not meet the definition of a "Silica fume", will be transferred to the new subsection: "§711-14 HIGH REACTIVITY POZZOLAN".

**TRANSMITTED MATERIALS:** The shelf notes containing the revisions to Sections 501 and 711-11 MICROSILICA, and the addition of a new Standard Specification titled: 711-14 HIGH REACTIVITY POZZOLAN, are attached. A separate set of shelf notes for the Standard Specifications of May 4, 2006 (Metric) and the Standard Specifications of May 1, 2008 (US Customary) are attached.

**BACKGROUND:** The Department's Standard Specification for item §711-11 MICROSILICA currently refers to AASHTO Standard Specification M 307. AASHTO M 307 has been recently revised such that the title has changed from "Microsilica for use in Concrete and Mortar" to "Silica Fume used in Cementitious Mixtures". The revised AASHTO M 307 standard allows only Silica Fume, and eliminates previously approved products such as metakaolin, rice hull ash, and natural pozzolans. These previously approved products are now categorized by AASHTO under a new Standard, titled; M 321 HIGH REACTIVITY POZZOLANS FOR USE IN HYDRAULIC CEMENT CONCRETE, MORTAR, AND

*GROUT.* The Department's Standard Specifications must be revised to comply with the changes in the AASHTO Standards.

**REFERENCES:** NYSDOT Standard Specifications Sections: 501, and 711-11.

AASHTO Standard Specifications Sections: M 307 *SILICA FUME USED IN CEMENTITIOUS MIXTURES* and M 321 *HIGH REACTIVITY POZZOLANS FOR USE IN HYDRAULIC CEMENT CONCRETE, MORTAR, AND GROUT.*

NYSDOT Materials Procedure 90-1, Materials Method 9.1 and Materials Method 10.

**CONTACT:** Direct questions to Thomas Izykowski in the Field Engineering 1 Section of the Materials Bureau by email @ [tizykowski@dot.state.ny.us](mailto:tizykowski@dot.state.ny.us), or by phone (518) 485-5282.

## PORTLAND CEMENT CONCRETE

Make the following changes to the Standard Specifications of May 4, 2006:

**Page 277:**

**Delete 501-2.01, Composition of Mixtures, and 501-2.02, Material Requirements, in their entirety, and replace with:**

**“501-2.01 Composition of Mixtures.** The Contractor shall inform the Regional Director, in writing, of the materials sources prior to mixing concrete. Proportion a homogenous Portland cement concrete mixture using the pre-approved materials listed under **501-2.02, Material Requirements.”**

Produce the class of concrete indicated in the contract documents. However, substitutions may be made according to Table 501-1, Concrete Class Options.

<b>TABLE 501-1 CONCRETE CLASS OPTIONS</b>	
Concrete Class	Allowable Class Options
A	C, E, F <sup>1</sup> , H or HP
C	HES <sup>2</sup>
D	DP
DP	None
E	H or HP
H	HP
F, G, GG, or HP	None
I	J
J	None

Notes:

1. Regional Director approval required for pavement applications, including approach slabs. D.C.E.S. approval required for structural or deck applications. May not be used in mass placements, or as a substitute for class A in Sign Structure, Signal Pole, and Luminary Foundations.

2. The requirements of §502-2.01 and §502-2.02 apply.

**501-2.02 Material Requirements**

Portland Cement	701-01	Admixtures	711-08
Blended Portland Cement	701-03	Fly Ash	711-10
Concrete Sand	703-07	Microsilica	711-11
Coarse Aggregate	703-02	GGBFS *	711-12
CNBCI **	711-13	HRP ***	711-14
Water	712-01		

\* Ground Granulated Blast Furnace Slag  
\*\* Calcium Nitrite Based Corrosion Inhibitors  
\*\*\* High Reactivity Pozzolan

**Page 278:**

After the paragraph titled; **“4. Microsilica”**, add the following paragraph:

**“5. High Reactivity Pozzolan.** High Reactivity Pozzolans which meet the requirements of §711-14 may be considered as supplementary cementitious materials in concrete mixtures where enhanced physical properties are desired. With prior approval from the Regional Materials Engineer, these materials may be allowed in lieu of microsilica in specialized and high performance concrete mixtures.”

**Page 280:**

**Delete paragraph C. Admixtures.** and replace it with the following:

**“C. Admixtures.** Use only admixtures which meet the requirements of §711-08, or §711-13, and which

## PORTLAND CEMENT CONCRETE

appear on the Department's Approved List of Materials. Admixtures which do not conform to these requirements are subject to evaluation by the Materials Bureau."

Under **501-2.03 Concrete Batching Facility Requirements. B. Bins**, *delete* the entire section, and *replace* with:

**"B. Bins.** Each facility requires:

- Sufficient size and number of storage bins to produce the quantity of concrete specified.
- Positive separations between fine aggregate and various sizes of coarse aggregates.
- Separate cement, pozzolan, High Reactivity Pozzolan, and microsilica bins, except Type I and Type II cement may be combined in common storage unless the cement is intended for use in high sulfate or salt water areas as described in §501-2.02 A. Cementitious Materials.
- Cement, pozzolan, High Reactivity Pozzolan and microsilica bins with protection from rain and moisture.
- A means of safely obtaining uncontaminated samples from all microsilica bins.
- A means of safely obtaining uncontaminated samples from any cement, pozzolan or High Reactivity Pozzolan bin that has been determined by the Regional Materials Engineer as either unsafe to sample, or difficult to verify the acceptability of its contents.

Sampling will be conducted, or witnessed by the Regional Materials Engineer's representative.

**Page 281:**

Under **D. Scales**. *Delete* the last paragraph which begins with "Provide a cradle..." and *replace* it with the following:

"Provide a cradle or test platform approved by the Regional Materials Engineer, for each scale. Provide at least 20 certified 25 kg. test weights for performing scale accuracy tests. The certification of compliance for the test weights must be made available upon request at the time of the scale accuracy test. The use of a set of test weights for multiple facilities may be permitted, providing that the test weights are available for use within one hour after request. Protect the scales, and displays from manipulation by locking or sealing. Any evidence of tampering will be cause for rejection."

**Page 282:**

Under **G. Recordation Equipment**. In the second bullet item after "pozzolan," *add* the following; "High Reactivity Pozzolan,"

**Page 287:**

Under **B. Admixtures**. *Delete* the first sentence entirely, and *replace* it with the following: "Admixtures are used to achieve the desired set retardation, water reduction, slump, air content, and to protect reinforcing steel from corrosion. Admixtures are not considered part of the solid volume in the concrete mixture."

After the paragraph titled "**3. Water Reduction**," *add* the following new paragraph:

**"4. Corrosion Inhibitors.** Corrosion Inhibitors, meeting the requirements of §711-13, may be used in special applications where specified in the plans, contract documents, or as directed by the Director, Materials Bureau."

After the paragraph titled "**E Microsilica**," *add* the following new paragraph:

**"F. High Reactivity Pozzolan (HRP).** When permitted by Regional Materials Engineer, HRP meeting the requirements of §711-14 may be batched independently as a partial replacement for Portland cement in specialized or high performance mixes."

**Page 288:**

Under **501-3.02. Handling Measuring and Batching Materials**, *delete* the second paragraph entirely, and *replace* it with the following:

## PORTLAND CEMENT CONCRETE

“When written approval is granted by the Director, Materials Bureau, bagged material may be incorporated into the mix. Adjust the batch size to use whole bags of bagged material. The handling, measuring and batching of bagged material must be verified and documented by a Department representative.

**Page 289:**

*Delete 501-3.02 C. Batching, and replace it with the following:*

**“C. Batching.**

**1. Aggregates.** When sizes are weighed cumulatively, allow a  $\pm 2\%$  tolerance for each draw mass, based on the combined aggregate batch mass. If sizes are weighed separately, apply the tolerance to each scale mass.

**2. Cement and Pozzolan.**

*a. Batching without microsilica or HRP added independently on a common scale.* Weigh the cement, blended cement, or pozzolan cumulatively with a  $\pm 1\%$  tolerance for each draw mass (based on the combined mass of all cementitious materials). Weigh the pozzolan last in the weighing sequence.”

*b. Batching with microsilica or HRP added independently on a common scale.* Weigh all cementitious materials cumulatively with a  $\pm 0.5\%$  tolerance for each draw mass (based on the combined mass of all cementitious materials). Double the minimum allowable batch mass. Weigh the microsilica or HRP last in the weighing sequence.

**3. Microsilica and High Reactivity Pozzolan (HRP).**

*a. Batching with cement, Type IP or SM blended cement, or pozzolan on a common scale.* Weigh the microsilica or HRP cumulatively with a  $\pm 0.5\%$  tolerance for each draw mass (based on the combined mass of all cementitious materials). Double the minimum allowable batch mass. Weigh the microsilica or HRP last in the weighing sequence.

*b. Batching microsilica or HRP on a separate scale.* Weigh the microsilica or HRP with a  $\pm 1\%$  tolerance (based on the total mass of microsilica or HRP.”

## PORTLAND CEMENT CONCRETE

**Page 291:**

Delete **TABLE 501-4** entirely, and *replace* it with the following:

<b>TABLE 501-4 BATCHING TOLERANCES<sup>3</sup></b>	
Cement, Pozzolan, or Blended Cement	± 1% (by mass) of total cementitious materials, if no microsilica or HRP is weighed cumulatively on a common scale.
	± 0.5% (by mass) of total cementitious materials, if microsilica or HRP is weighed cumulatively on a common scale.
Microsilica or HRP	± 0.5% (by mass) of total cementitious materials, if weighed cumulatively with any other cementitious material.
	± 1% (by mass) if weighed on a separate scale.
Aggregates	± 2% (by mass)
Water <sup>1</sup>	± 1%
Admixtures (711-08, or 711-13)	± 3% by volume, or ± 1 meter pulse, whichever is greater.
Admixtures (others)	Contact Director, Materials Bureau
Zero - Aggregate <sup>2</sup>	± 2%
Zero - Cementitious Materials <sup>2</sup>	± 1%
Zero-Water (weighed) <sup>1,2</sup>	± 1%

**NOTES:** 1: Tolerance applies to water batched at central mix plants only.

2: Zero tolerance applies to empty scales, based on the minimum allowable batch size.

3. All tolerances are based on the pre-programmed target quantity.”

## MICROSILICA AND POZZOLANS

Make the following changes to the Standard Specifications of May 4, 2006:

**Page 834:**

*Delete* Section 711-11 **MICROSILICA** and *replace* it with the following:

### "711-11 MICROSILICA

**SCOPE.** This specification covers the material requirements for Microsilica (Silica Fume) for use in enhancing the performance properties of Portland Cement Concrete, shotcrete and other mixtures.

**GENERAL.** Supply Microsilica admixture in bulk form as a dry powder. When necessary for testing purposes, or in special placement situations, the admixture may be supplied in bags or barrels.

**MATERIAL REQUIREMENTS.** For approved list consideration, submit supporting documentation showing conformance with the standard and optional physical and chemical requirements of AASHTO M 307 *SILICA FUME*, and the following:

**Uniformity of Silicon Dioxide Content:** Maximum  $\pm 7.0\%$  variation between any two samples.

**Chloride Content:** 0.20% maximum (as determined by AASHTO T 260, Procedure B).

**Fineness:** *Undensified powder:* 10% maximum percent retained on the 45- $\mu\text{m}$  sieve (AASHTO T 192).

**MONITOR SAMPLING.** For monitor sampling of previously approved materials, follow the procedures directed in Materials Procedure 90-1 or Materials Method 10. The Department will monitor the product for conformity with the standard physical and chemical requirements of AASHTO M 307 at its discretion.

**BASIS OF APPROVAL.** Manufacturers or material suppliers desiring to have products considered for inclusion on the Approved List shall submit one 20 liter sample of the admixture for each manufacturing or supply location to the Materials Bureau.

Provide a Quality Control report for each manufacturing or supply location. The report will be required prior to Departments evaluation of the product, and annually thereafter. Details of the Quality Control report are available from the Materials Bureau. If the material will be manufactured or supplied from multiple locations, identify each location separately. Submit a separate sample and Quality Control Report for each manufacturing or supply location.

Submit laboratory test results from a testing laboratory that is accepted by the Cement and Concrete Reference Laboratory (CCRL) indicating conformance to this specification. For each sample submitted for approved list evaluation, provide a certification declaring conformance to this, and the applicable AASHTO specification, the production lot number, the date of manufacture, and the date tested. Clearly state the chemical and physical properties as required by AASHTO M 307, and the pH of the material. Provide supporting data, relative to these specifications, detailing the performance of the product when used in concrete mixtures. Provide a manufacturer's label clearly stating the product and manufacturer's name and a Material Safety Data Sheet for each product submitted for approved list evaluation.

The Department will test the submitted sample in accordance with these specifications and Department instructions. The review process requires a minimum of 30 calendar days. Test procedures are available from the Materials Bureau upon request. Upon approval, the name of the manufacturer and the product will be placed on the Approved List.

**BASIS OF ACCEPTANCE.** Each shipment will be considered for acceptance where it will be incorporated into the concrete. Acceptance will be based on the product name appearing on the Approved List, and a material certification indicating conformance to this specification. The Department reserves the right to monitor the performance of any previously approved Microsilica from concrete production. If the monitor test results indicate that the sampled product does not meet this specification, the concrete incorporating the product represented by the sample may be rejected."

## MICROSILICA AND POZZOLANS

**Page 836:**

*Add* the following new section after Section 711-13:

### "711-14 HIGH REACTIVITY POZZOLAN

**SCOPE.** This specification covers the material requirements for High Reactivity Pozzolan for use in enhancing the performance properties of Portland Cement Concrete, shotcrete and other mixtures.

**GENERAL.** Supply the High Reactivity Pozzolan admixture in bulk form as a dry powder. When necessary for testing purposes, or in special placement situations, the admixture may be supplied in bags or barrels.

**MATERIAL REQUIREMENTS.** For approved list consideration, submit supporting documentation showing conformance with the standard and optional physical and chemical requirements of AASHTO M 321 *HIGH REACTIVITY POZZOLANS FOR USE IN HYDRAULIC CEMENT CONCRETE, MORTAR, AND GROUT*, and the following:

**Uniformity of Reactive Oxides:** Maximum  $\pm 7.0\%$  variation between any two samples.

**Chloride Content:** 0.20% maximum (as determined by AASHTO T 260, Procedure B).

**Fineness:** 10% maximum percent retained on the 45- $\mu$ m sieve (AASHTO T 192).

**MONITOR SAMPLING.** For monitor sampling of previously approved materials, follow the procedures directed in Materials Procedure 90-1 or Materials Method 10. The Department will monitor the product for conformity with the physical and chemical requirements of AASHTO M 321 at its discretion.

**BASIS OF APPROVAL.** Manufacturers or material suppliers desiring to have products considered for inclusion on the Approved List shall submit one 20 liter sample of the admixture for each manufacturing or supply location to the Materials Bureau.

Provide a Quality Control report for each manufacturing or supply location. The report will be required prior to Departments evaluation of the product, and annually thereafter. Details of the Quality Control plan are available by contacting the Materials Bureau. If the material will be manufactured or supplied from multiple locations, identify each location separately. Submit a separate sample and Quality Control Report for each location.

Submit laboratory test results from a testing laboratory that is accepted by the Cement and Concrete Reference Laboratory (CCRL) indicating conformance to this specification. For each sample submitted for approved list evaluation, provide a certification declaring conformance to this, and the applicable AASHTO specification, the production lot number, the date of manufacture, and the date tested. Clearly state the chemical and physical properties as required by AASHTO M 321, and the pH of the material. Provide supporting data, relative to these specifications, detailing the performance of the product when used in concrete mixtures. Provide a manufacturer's label clearly stating the product and manufacturer's name and a Material Safety Data Sheet for each product submitted for approved list evaluation.

The Department will test the submitted sample in accordance with these specifications and Department instructions. The review process requires a minimum of 30 calendar days. Test procedures are available from the Materials Bureau upon request. Upon approval, the name of the manufacturer and the product will be placed on the Approved List.

**BASIS OF ACCEPTANCE.** Each shipment will be considered for acceptance where it will be incorporated into the concrete. Acceptance will be based on the product name appearing on the Approved List, and a material certification indicating conformance to this specification. The Department reserves the right to monitor the performance of any previously approved High Reactivity Pozzolan from actual concrete production. If the monitor test results indicate that the sampled product does not meet this specification, the concrete incorporating the product represented by the sample may be rejected."

## PORTLAND CEMENT CONCRETE

Make the following changes to the Standard Specifications of May 1, 2008:

**Delete 501-2.01, Composition of Mixtures, and 501-2.02, Material Requirements.** in their entirety, and *replace* with:

**“501-2.01 Composition of Mixtures.** The Contractor shall inform the Regional Director, in writing, of the materials sources prior to mixing concrete. Proportion a homogenous Portland cement concrete mixture using the pre-approved materials listed under **501-2.02, Material Requirements.**”

Produce the class of concrete indicated in the contract documents. However, substitutions may be made according to Table 501-1, Concrete Class Options.

<b>TABLE 501-1 CONCRETE CLASS OPTIONS</b>	
Concrete Class	Allowable Class Options
A	C, E, F <sup>1</sup> , H or HP
C	HES <sup>2</sup>
D	DP
DP	None
E	H or HP
H	HP
F, G, GG, or HP	None
I	J
J	None

Notes:

1. Regional Director approval required for pavement applications, including approach slabs. D.C.E.S. approval required for structural or deck applications. May not be used in mass placements, or as a substitute for class A in Sign Structure, Signal Pole, and Luminary Foundations.

2. The requirements of §502-2.01 and §502-2.02 apply.

### 501-2.02 Material Requirements

Portland Cement	701-01	Admixtures	711-08
Blended Portland Cement	701-03	Fly Ash	711-10
Concrete Sand	703-07	Microsilica	711-11
Coarse Aggregate	703-02	GGBFS *	711-12
CNBCI **	711-13	HRP ***	711-14
Water	712-01		

\* Ground Granulated Blast Furnace Slag  
\*\* Calcium Nitrite Based Corrosion Inhibitors  
\*\*\* High Reactivity Pozzolan

Under subsection **A. Cementitious Materials.** After the paragraph titled; “**4. Microsilica**”, *add* the following new paragraph:

**“5. High Reactivity Pozzolan.** High Reactivity Pozzolans which meet the requirements of §711-14 may be considered as supplementary cementitious materials in concrete mixtures where enhanced physical properties are desired. With prior approval from the Regional Materials Engineer, these materials may be allowed in lieu of microsilica in specialized and high performance concrete mixtures.”

Under subsection **C. Admixtures.** *Delete* the entire paragraph, and *replace* it with the following:

## PORTLAND CEMENT CONCRETE

**“C. Admixtures.** Use only admixtures which meet the requirements of §711-08, or §711-13, and which appear on the Department’s Approved List of Materials. Admixtures which do not conform to these requirements are subject to evaluation by the Materials Bureau.”

Under **501-2.03 Concrete Batching Facility Requirements. B. Bins.,** *delete* the entire section, and *replace* with:

**“B. Bins.** Each facility requires:

- Sufficient size and number of storage bins to produce the quantity of concrete specified.
- Positive separations between fine aggregate and various sizes of coarse aggregates.
- Separate cement, pozzolan, High Reactivity Pozzolan, and microsilica bins, except Type I and Type II cement may be combined in common storage unless the cement is intended for use in high sulfate or salt water areas as described in §501-2.02 A. Cementitious Materials.
- Cement, pozzolan, High Reactivity Pozzolan and microsilica bins with protection from rain and moisture.
- A means of safely obtaining uncontaminated samples from all microsilica bins.
- A means of safely obtaining uncontaminated samples from any cement, pozzolan or High Reactivity Pozzolan bin that has been determined by the Regional Materials Engineer as either unsafe to sample, or difficult to verify the acceptability of its contents.

Sampling will be conducted, or witnessed by the Regional Materials Engineer’s representative.

Under **D. Scales.** *Delete* the last paragraph which begins with “Provide a cradle...” and *replace* it with the following:

“Provide a cradle or test platform approved by the Regional Materials Engineer, for each scale. Provide at least 20 certified 50 lb. test weights for performing scale accuracy tests. The certification of compliance for the test weights must be made available upon request at the time of the scale accuracy test. The use of a set of test weights for multiple facilities may be permitted, providing that the test weights are available for use within one hour after request. When directed by the Regional Director, protect the scales, and displays from manipulation by locking or sealing. Any evidence of tampering will be cause for rejection.”

Under **G. Recordation Equipment.** In the second bullet item after “pozzolan,” *add* the following: “High Reactivity Pozzolan,”

Under **501-3 CONSTRUCTION DETAILS, 501-3.01 Proportioning,** subsection **B. Admixtures.** *Delete* the first sentence entirely, and *replace* it with the following: “Admixtures are used to achieve the desired set retardation, water reduction, slump, air content, and to protect reinforcing steel from corrosion. Admixtures are not considered part of the solid volume in the concrete mixture.”

After the paragraph titled “**3. Water Reduction.**”, *add* the following new paragraph:

**“4. Corrosion Inhibitors.** Corrosion Inhibitors, meeting the requirements of §711-13, may be used in special applications where specified in the plans, contract documents, or as directed by the Director, Materials Bureau.”

After the paragraph titled “**E Microsilica.**”, *add* the following new paragraph:

**“F. High Reactivity Pozzolan (HRP).** When permitted by Regional Materials Engineer, HRP meeting the requirements of §711-14 may be batched independently as a partial replacement for Portland cement in specialized or high performance mixes.”

## PORTLAND CEMENT CONCRETE

Under **501-3.02 Handling Measuring and Batching Materials**, *delete* the second paragraph entirely, and *replace* it with the following:

“When written approval is granted by the Director, Materials Bureau, bagged material may be incorporated into the mix. Adjust the batch size to use whole bags of bagged material. The handling, measuring and batching of bagged material must be verified and documented by a Department representative.

*Delete 501-3.02 C. Batching.*, and *replace* it with the following:

### **“C. Batching.**

**1. Aggregates.** When sizes are weighed cumulatively, allow a  $\pm 2\%$  tolerance for each draw weight, based on the combined aggregate batch weight. If sizes are weighed separately, apply the tolerance to each scale weight.

### **2. Cement and Pozzolan.**

*a. Batching without microsilica or HRP added independently on a common scale.* Weigh the cement, blended cement, or pozzolan cumulatively with a  $\pm 1\%$  tolerance for each draw weight (based on the combined weight of all cementitious materials). Weigh the pozzolan last in the weighing sequence.”

*b. Batching with microsilica or HRP added independently on a common scale.* Weigh all cementitious materials cumulatively with a  $\pm 0.5\%$  tolerance for each draw weight (based on the combined weight of all cementitious materials). Double the minimum allowable batch weight. Weigh the microsilica or HRP last in the weighing sequence.

### **3. Microsilica and High Reactivity Pozzolan (HRP).**

*a. Batching with cement, Type IP or SM blended cement, or pozzolan on a common scale.* Weigh the microsilica or HRP cumulatively with a  $\pm 0.5\%$  tolerance for each draw weight (based on the combined weight of all cementitious materials). Double the minimum allowable batch weight. Weigh the microsilica or HRP last in the weighing sequence.

*b. Batching microsilica or HRP on a separate scale.* Weigh the microsilica or HRP with a  $\pm 1\%$  tolerance (based on the total weight of microsilica or HRP.”

## PORTLAND CEMENT CONCRETE

Delete **TABLE 501-4** entirely, and *replace* it with the following:

<b>TABLE 501-4 BATCHING TOLERANCES<sup>3</sup></b>	
Cement, Pozzolan, or Blended Cement	± 1% (by weight) of total cementitious materials, if no microsilica or HRP is weighed cumulatively on a common scale.
	± 0.5% (by weight) of total cementitious materials, if microsilica or HRP is weighed cumulatively on a common scale.
Microsilica or HRP	± 0.5% (by weight) of total cementitious materials, if weighed cumulatively with any other cementitious material.
	± 1% (by weight) if weighed on a separate scale.
Aggregates	± 2% (by weight)
Water <sup>1</sup>	± 1%
Admixtures (711-08, or 711-13)	± 3% by volume, or ± 1 meter pulse, whichever is greater.
Admixtures (others)	Contact Director, Materials Bureau
Zero - Aggregate <sup>2</sup>	± 2%
Zero - Cementitious Materials <sup>2</sup>	± 1%
Zero-Water (weighed) <sup>1,2</sup>	± 1%

**NOTES:** 1: Tolerance applies to water batched at central mix plants only.

2: Zero tolerance applies to empty scales, based on the minimum allowable batch size.

3. All tolerances are based on the pre-programmed target quantity.”

## MICROSILICA AND POZZOLANS

Make the following changes to the Standard Specifications of May 1, 2008:

Under **SECTION 711 CONCRETE CURING MATERIALS AND ADMIXTURES;**  
*Delete* the entire section titled “**711-11 MICROSILICA**” and *replace* with the following:

### “711-11 MICROSILICA

**SCOPE.** This specification covers the material requirements for Microsilica (Silica Fume) for use in enhancing the performance properties of Portland Cement Concrete, shotcrete and other mixtures.

**GENERAL.** Supply Microsilica admixture in bulk form as a dry powder. When necessary for testing purposes, or in special placement situations, the admixture may be supplied in bags or barrels.

**MATERIAL REQUIREMENTS.** For approved list consideration, submit supporting documentation showing conformance with the standard and optional physical and chemical requirements of AASHTO M 307 *SILICA FUME*, and the following:

**Uniformity of Silicon Dioxide Content:** Maximum  $\pm 7.0\%$  variation between any two samples.

**Chloride Content:** 0.20% maximum (as determined by AASHTO T 260, Procedure B).

**Fineness:** *Undensified powder:* 10% maximum percent retained on the No. 325 sieve (AASHTO T 192).

**MONITOR SAMPLING.** For monitor sampling of previously approved materials, follow the procedures directed in Materials Procedure 90-1 or Materials Method 10. The Department will monitor the product for conformity with the standard physical and chemical requirements of AASHTO M 307 at its discretion.

**BASIS OF APPROVAL.** Manufacturers or material suppliers desiring to have products considered for inclusion on the Approved List shall submit one 5 gallon sample of the admixture for each manufacturing or supply location to the Materials Bureau.

Provide a Quality Control report for each manufacturing or supply location. The report will be required prior to Departments evaluation of the product, and annually thereafter. Details of the Quality Control report are available from the Materials Bureau. If the material will be manufactured or supplied from multiple locations, identify each location separately. Submit a separate sample and Quality Control Report for each manufacturing or supply location.

Submit laboratory test results from a testing laboratory that is accepted by the Cement and Concrete Reference Laboratory (CCRL) indicating conformance to this specification. For each sample submitted for approved list evaluation, provide a certification declaring conformance to this, and the applicable AASHTO specification, the production lot number, the date of manufacture, and the date tested. Clearly state the chemical and physical properties as required by AASHTO M 307, and the pH of the material. Provide supporting data, relative to these specifications, detailing the performance of the product when used in concrete mixtures. Provide a manufacturer’s label clearly stating the product and manufacturer’s name and a Material Safety Data Sheet for each product submitted for approved list evaluation.

The Department will test the submitted sample in accordance with these specifications and Department instructions. The review process requires a minimum of 30 calendar days. Test procedures are available from the Materials Bureau upon request. Upon approval, the name of the manufacturer and the product will be placed on the Approved List.

## MICROSILICA AND POZZOLANS

**BASIS OF ACCEPTANCE.** Each shipment will be considered for acceptance where it will be incorporated into the concrete. Acceptance will be based on the product name appearing on the Approved List, and a material certification indicating conformance to this specification. The Department reserves the right to monitor the performance of any previously approved Microsilica from concrete production. If the monitor test results indicate that the sampled product does not meet this specification, the concrete incorporating the product represented by the sample may be rejected.”

After the section titled **711-13 CALCIUM NITRATE BASED CORROSION INHIBITORS**, *add* the following new Section:

### “711-14 HIGH REACTIVITY POZZOLAN

**SCOPE.** This specification covers the material requirements for High Reactivity Pozzolan for use in enhancing the performance properties of Portland Cement Concrete, shotcrete and other mixtures.

**GENERAL.** Supply the High Reactivity Pozzolan admixture in bulk form as a dry powder. When necessary for testing purposes, or in special placement situations, the admixture may be supplied in bags or barrels.

**MATERIAL REQUIREMENTS.** For approved list consideration, submit supporting documentation showing conformance with the standard and optional physical and chemical requirements of AASHTO M 321 *HIGH REACTIVITY POZZOLANS FOR USE IN HYDRAULIC CEMENT CONCRETE, MORTAR, AND GROUT*, and the following:

**Uniformity of Reactive Oxides:** Maximum  $\pm 7.0\%$  variation between any two samples.

**Chloride Content:** 0.20% maximum (as determined by AASHTO T 260, Procedure B).

**Fineness:** 10% maximum percent retained on the No. 325 sieve (AASHTO T 192).

**MONITOR SAMPLING.** For monitor sampling of previously approved materials, follow the procedures directed in Materials Procedure 90-1 or Materials Method 10. The Department will monitor the product for conformity with the physical and chemical requirements of AASHTO M 321 at its discretion.

**BASIS OF APPROVAL.** Manufacturers or material suppliers desiring to have products considered for inclusion on the Approved List shall submit one 5 gallon sample of the admixture for each manufacturing or supply location to the Materials Bureau.

Provide a Quality Control report for each manufacturing or supply location. The report will be required prior to Departments evaluation of the product, and annually thereafter. Details of the Quality Control plan are available by contacting the Materials Bureau. If the material will be manufactured or supplied from multiple locations, identify each location separately. Submit a separate sample and Quality Control Report for each location.

Submit laboratory test results from a testing laboratory that is accepted by the Cement and Concrete Reference Laboratory (CCRL) indicating conformance to this specification. For each sample submitted for approved list evaluation, provide a certification declaring conformance to this, and the applicable AASHTO specification, the production lot number, the date of manufacture, and the date tested. Clearly state the chemical and physical properties as required by AASHTO M 321, and the pH of the material. Provide supporting data, relative to these specifications, detailing the performance of the product when used in concrete mixtures. Provide a manufacturer's label clearly stating the product and manufacturer's name and a Material Safety Data Sheet for each product submitted for approved list evaluation.

## MICROSILICA AND POZZOLANS

The Department will test the submitted sample in accordance with these specifications and Department instructions. The review process requires a minimum of 30 calendar days. Test procedures are available from the Materials Bureau upon request. Upon approval, the name of the manufacturer and the product will be placed on the Approved List.

**BASIS OF ACCEPTANCE.** Each shipment will be considered for acceptance where it will be incorporated into the concrete. Acceptance will be based on the product name appearing on the Approved List, and a material certification indicating conformance to this specification. The Department reserves the right to monitor the performance of any previously approved High Reactivity Pozzolan from actual concrete production. If the monitor test results indicate that the sampled product does not meet this specification, the concrete incorporating the product represented by the sample may be rejected.”