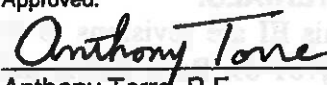


|                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                    |                                                                                                                                                                                               |                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| <b>SUPERSEDED BY</b><br><b>EB 15-031</b><br><b>EFFECTIVE 9/28/15</b>                                                                                                                                                                                                                                                                                                                            |  | New York State<br>Department of<br>Transportation<br><b>ENGINEERING<br/>         INSTRUCTION</b>                                                                                              | <b>EI</b><br><b>12-009</b> |
| <b>Title: REVISIONS TO STANDARD SPECIFICATIONS §701-04, §701-05, §701-06, §701-08, AND §701-09</b>                                                                                                                                                                                                                                                                                              |                                                                                    |                                                                                                                                                                                               |                            |
| <b>Target Audience:</b><br><input checked="" type="checkbox"/> Manufacturers (18)<br><input checked="" type="checkbox"/> Local Govt. (31)<br><input checked="" type="checkbox"/> Agencies (32)<br><input type="checkbox"/> Surveyors (33)<br><input checked="" type="checkbox"/> Consultants (34)<br><input checked="" type="checkbox"/> Contractors (39)<br><input type="checkbox"/> _____ ( ) |                                                                                    | <b>Approved:</b><br><br>Anthony Torre, P.E.<br>Acting Deputy Chief Engineer, Research<br>04-12-2012<br>Date |                            |

#### ADMINISTRATIVE INFORMATION:

- This Engineering Instruction (EI) is effective with projects submitted for the letting of September 6, 2012.
- Superseded issuance(s): This EI does not supersede any previous issuance.
- These revisions will be incorporated into a future edition of the Standard Specifications.

#### PURPOSE:

- The purpose of this EI is to revise the Standards Specification for the following:  
 §701-04 Concrete Repair Material  
 §701-05 Concrete Grouting Material  
 §701-06 Cement Based Grout Materials for Shear Keys  
 §701-08 Vertical and Overhead Patching Material  
 §701-09 Rapid Hardening Concrete Repair Material (Normal Weather)

#### TECHNICAL INFORMATION:

- The Standard Specifications for materials referenced in this EI have been revised to performance based specifications. In the previous Standard Specifications, wording did not allow alternate types of materials or new technologies to be used in some concrete repair or grouting applications. The wording "Portland Cement Based" has been removed from the specifications allowing alternative types of material to be used provided all the performance based requirements are met. With continuous technological advancements in the concrete industry, these performance based requirements will allow the selection of alternative material types that will perform acceptably. A series of performance based requirements must be achieved in order to be accepted for inclusion on the Approved List of Materials and Equipment.
- This EI establishes new and enhanced requirements for these specifications that will more accurately represent field placement conditions. Some of the existing products on the Approved List may not comply with these new requirements. Using our existing test data, products that do not meet the new specifications will be notified and will remain on the Approved List for 24 months from the time of this EI issuance. These products will be designated with an asterisk or subscript next to the product name. These products will be removed from the Approved List after 24 months unless new independent laboratory test data is submitted that complies with the new specifications. The Standard Specifications revisions will also bring uniformity regarding performance requirements among some test methods such as Freeze/Thaw, 1 Day Bond Strength, Chloride Content, Sulfate Content, and color (Munsell Neutral Scale). These test results can be used interchangeably when products apply for multiple Approved List items, which in turn will reduce repetitive testing of the same material.
- Cost Impact - There is no anticipated cost increase when comparing the new revised specifications to the existing specifications for materials referenced in this EI.

## **EI 12-009 Page 2 of 2**

### **IMPLEMENTATION:**

- Main Office Design Quality Assurance Bureau will insert the revision to the Standard Specifications into contract proposals beginning with projects submitted for the letting of September 6, 2012.

### **TRANSMITTED MATERIALS:**

- Attached to this EI are revisions to the Standard Specifications for §701-04, §701-05, §701-06, §701-08, and §701-09. Both Metric and US Customary versions are attached.

### **BACKGROUND:**

- Concrete Industry continues to evolve and the use of alternative materials has become more prevalent. Products, which contain materials other than portland cement, have been developed and performed sufficiently well in concrete repair and grouting applications.

### **CONTACT:**

- Direct any questions concerning this EI to William Goss of the Field Engineering 1 Office of the Materials Bureau via email at [wgoss@dot.state.ny.us](mailto:wgoss@dot.state.ny.us) or at (518) 457-4592.

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

**Page 722 Under §701-04 CONCRETE REPAIR MATERIAL, delete the section in its entirety, and replace it with the following:**

#### **701-04 CONCRETE REPAIR MATERIAL**

**SCOPE.** The material covered in this specification is generally used for shallow repairs of portland cement concrete, including repair of precast concrete products, such as pipe, cribbing, manholes, etc...

**GENERAL.** The use of this material is limited to repair areas smaller than 0.5 m<sup>2</sup> and not deeper than 50 mm. This material is meant to be applied and finished with a trowel in a horizontal position. The Department will test the material in accordance with Test Method NY 701-13P,C following the manufacturer's proportioning and mixing instructions printed on the package. Material meeting the requirements of this specification will be placed on the Approved List. For field use, follow the manufacturers mixing and curing recommendations.

**MATERIAL REQUIREMENTS.** The material shall be a prepackaged dry component: to which water or emulsified compound is added, used for concrete repair, containing no metallic expansion aides, to which no aggregate may be added, meeting the requirements of Table 701-04. When being used for aesthetic purposes the material's color shall be within the Munsell Neutral Scale range stated in table 701-04.

| <b>TABLE 701-04<br/>CONCRETE REPAIR MATERIAL</b> |             |             |
|--------------------------------------------------|-------------|-------------|
| <b>TEST REQUIREMENT</b>                          | <b>Min.</b> | <b>Max.</b> |
| Initial Set (minutes)                            | 10          | 60          |
| Expansion (%)                                    | -           | 0.4         |
| Contraction (%)                                  | -           | 0.0         |
| 1 Day Compressive Strength (MPa)                 | 21          | -           |
| 7 Day Compressive Strength (MPa)                 | 35          | -           |
| 28 Day Compressive Strength (MPa)                | 42          | -           |
| 1 Day Bond Strength (MPa)                        | 1.5         | -           |
| Freeze/Thaw Loss % (25 cycles)                   | -           | 1.0         |
| Total Chloride Content (% by weight)             | -           | 0.05        |
| Total Sulfate Content (% by weight)              | -           | 5.0         |
| Color, Munsell Neutral Scale                     | 4.0         | 8.5         |

**BASIS OF APPROVAL.** Application for material approval shall be submitted to the Materials Bureau by the manufacturer. The application shall be accompanied by a labeled 23 kg production sample of the product; however the Materials Bureau will approve other packaging quantities on a case-by-case basis. The Department will test the material according to Test Method NY 701-13P,C following the manufacturer's proportioning and mixing instructions printed on the package. Upon approval, the product brand name, manufacturing location and shelf life will be placed on the Approved List. The Department must receive a letter from the manufacturer annually certifying that no changes have been made in the formulation, manufacturing process, or manufacturing location. In the event that a letter is not received, the product may be removed from the Approved List. Furthermore, the material may be removed from the Approved List at any time if the Department is not notified in writing of any material changes as stated above. The Department reserves the right to sample and test the material at any time.

**BASIS OF ACCEPTANCE.** Products will be accepted on the basis of the brand name and manufacturing location appearing on the Approved List. Such products will then be accepted on the basis of the brand name and manufacturing location printed on the sealed, non reusable container along with the month and year (i.e. 05/2011) of when the material was manufactured. The manufacturer is required to print the shelf life on the container if it is less than 12 months. The expiration date of acceptance for this material shall be one calendar year from the date of manufacture or as stated in the Approved List, whichever is less.

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

**Page 722 Under §701-05 CONCRETE GROUTING MATERIAL, delete the section in its entirety, and replace it with the following:**

**701-05 CONCRETE GROUTING AND ANCHORING MATERIAL**

**SCOPE.** This specification covers the requirements for grouting material used to grout anchor bolts, dowels and other items in portland cement concrete. This material can also be used for forming mortar pads under bridge rail supports.

**GENERAL.** This material should not be used in layers thicker than 50 mm. The Department will test the material according to Test Method NY 701-11P,C following the manufacturer's proportioning and mixing instructions printed on the package. Material meeting the requirements of this specification will be placed on the Approved List. For field use, follow the manufacturers mixing and curing recommendations.

**MATERIAL REQUIREMENTS.** The material shall be a prepackaged dry component: to which water or emulsified compound is added, used for concrete repair, containing no metallic expansion aides, to which no aggregate may be added, meeting the requirements of Table 701-05.

| TABLE 701-05<br>CONCRETE GROUTING AND ANCHORING MATERIAL |      |      |
|----------------------------------------------------------|------|------|
| TEST REQUIREMENT                                         | Min. | Max. |
| Initial Set (minutes)                                    | 30   | -    |
| Expansion (%)                                            | -    | 0.4  |
| Contraction (%)                                          | -    | 0.0  |
| 1 Day Compressive Strength (MPa)                         | 21   | -    |
| 7 Day Compressive Strength (MPa)                         | 42   | -    |
| Pullout Strength (kN)                                    | 45   | -    |
| Freeze-Thaw Loss % (25 cycles)                           | -    | 1.0  |
| Total Chloride Content (% by weight)                     | -    | 0.05 |
| Total Sulfate Content (% by weight)                      | -    | 5.0  |

**BASIS OF APPROVAL.** Application for material approval shall be submitted to the Materials Bureau by the manufacturer. The application shall be accompanied by a labeled 23 kg production sample of the product; however the Materials Bureau will approve other packaging quantities on a case-by-case basis. The Department will test the material according to Test Method NY 701-11P,C following the manufacturer's proportioning and mixing instructions printed on the package. Upon approval, the product brand name, manufacturing location and shelf life will be placed on the Approved List. The Department must receive a letter from the manufacturer annually certifying that no changes have been made in the formulation, manufacturing process, or manufacturing location. In the event that a letter is not received, the product may be removed from the Approved List. Furthermore, the material may be removed from the Approved List at any time if the Department is not notified in writing of any material changes as stated above. The Department reserves the right to sample and test the material at any time.

**BASIS OF ACCEPTANCE.** Products will be accepted on the basis of the brand name and manufacturing location appearing on the Approved List. Such products will then be accepted on the basis of the brand name and manufacturing location printed on the sealed, non reusable container along with the month and year (i.e. 05/2011) of when the material was manufactured. The manufacturer is required to print the shelf life on the container if it is less than 12 months. The expiration date of acceptance for this material shall be one calendar year from the date of manufacture or as stated in the Approved List, whichever is less.

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

Page 723 Under §701-06 CEMENT BASED GROUT MATERIALS FOR SHEAR KEYS, *delete* the section in its entirety, and *replace* it with the following:

#### 701-06 SHEAR KEY GROUT

**SCOPE.** This specification covers the requirements for grout to be placed in shear keys between precast concrete structural units.

**GENERAL.** The material must be flowable to fill the shear key with no voids. The Department will test the material in accordance with Test Method NY 701-12P,C following the manufacturer's proportioning and mixing instructions printed on the package. Material meeting the requirements of this specification will be placed on the Approved List. The Approved List titled: Shear Key Grout will state the precise water-grout ratio by weight. This ratio shall not be altered. For field use, follow the manufacturers mixing and curing recommendations.

**MATERIAL REQUIREMENTS.** The material shall be a prepackaged dry component: to which water or emulsified compound is added, used for concrete repair, containing no metallic expansion aides, to which no aggregate may be added. The material must meet the shear key pourability test as per Test Method NY 701-12P,C and the requirements of Table 701-06.

| TABLE 701-06<br>SHEAR KEY GROUT      |      |      |
|--------------------------------------|------|------|
| TEST REQUIREMENT                     | Min. | Max. |
| Initial Set (minutes)                | 120  | -    |
| Expansion (%)                        | 0.02 | 1.0  |
| Contraction (%)                      | -    | 0.0  |
| 7 Day Compressive Strength (MPa)     | 42   | -    |
| Freeze-Thaw Loss % (25 cycles)       | -    | 1.0  |
| Total Chloride Content (% by weight) | -    | 0.05 |
| Total Sulfate Content (% by weight)  | -    | 5.0  |

Revisions to Standard Specifications §701-04, §701-05, §701-06, §701-08, and §701-09

**BASIS OF APPROVAL.** Application for material approval shall be submitted to the Materials Bureau by the manufacturer. The application shall be accompanied by a labeled 23 kg production sample of the product; however the Materials Bureau will approve other packaging quantities on a case-by-case basis. The Department will test the material according to Test Method NY 701-12P,C following the manufacturer's proportioning and mixing instructions printed on the package. Upon approval, the product brand name, manufacturing location and shelf life will be placed on the Approved List. The Department must receive a letter from the manufacturer annually certifying that no changes have been made in the formulation, manufacturing process, or manufacturing location. In the event that a letter is not received, the product may be removed from the Approved List. Furthermore, the material may be removed from the Approved List at any time if the Department is not notified in writing of any material changes as stated above. The Department reserves the right to sample and test the material at any time.

**BASIS OF ACCEPTANCE.** Products will be accepted on the basis of the brand name and manufacturing location appearing on the Approved List. Such products will then be accepted on the basis of the brand name and manufacturing location printed on the sealed, non reusable container along with the month and year (i.e. 05/2011) of when the material was manufactured. The manufacturer is required to print the shelf life on the container if it is less than 12 months. The expiration date of acceptance for this material shall be one calendar year from the date of manufacture or as stated in the Approved List, whichever is less.

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

**Page 725 Under §701-08 VERTICAL AND OVERHEAD PATCHING MATERIAL, delete the section in its entirety, and *replace* it with the following:**

**701-08 VERTICAL AND OVERHEAD REPAIR MATERIAL**

**SCOPE.** This specification covers the requirements for Vertical and Overhead Repair Material for placement in structural concrete repairs.

**GENERAL.** The use of this material is limited to repair areas smaller than 0.5 m<sup>2</sup> and not deeper than 50 mm, and is meant to be applied and finished with a trowel. The Materials Bureau will consider other application techniques on a case by case basis. The Department will test the material in accordance with Test Method NY 701-17P,C following the manufacturer's proportioning and mixing instructions printed on the package. Material meeting the requirements of this specification will be placed on the Approved List. For field use, follow the manufacturers mixing and curing recommendations.

**MATERIAL REQUIREMENTS.** The material shall be a prepackaged dry component: to which water or emulsified compound is added, used for concrete repair, containing no metallic expansion aides, to which no aggregate may be added. The material shall be able to be placed in layers of at least 25 mm on overhead applications without the use of formwork or anchoring devices. When being used for aesthetic purposes the material's color shall be within the Munsell Neutral Scale range stated in Table 701-08.

| TABLE 701-08<br>VERTICAL AND OVERHEAD REPAIR MATERIAL |      |      |
|-------------------------------------------------------|------|------|
| TEST REQUIREMENT                                      | Min. | Max. |
| Initial Set (minutes)                                 | 15   | -    |
| Expansion (%)                                         | -    | 0.4  |
| Contraction (%)                                       | -    | 0.0  |
| 7 Day Compressive Strength (MPa)                      | 28   | -    |
| 28 Day Compressive Strength (MPa)                     | 35   | -    |
| 1 Day Bond Strength (MPa)                             | 1.5  | -    |
| Freeze-Thaw Loss % (25 cycles)                        | -    | 1.0  |
| Total Chloride Content (% by weight)                  | -    | 0.05 |
| Total Sulfate Content (% by weight)                   | -    | 5.0  |
| Color, Munsell Neutral Scale                          | 4.0  | 8.5  |

**BASIS OF APPROVAL.** Application for material approval shall be submitted to the Materials Bureau by the manufacturer. The application shall be accompanied by a labeled 23 kg production sample of the product; however the Materials Bureau will approve other packaging quantities on a case-by-case basis. The Department will test the material according to Test Method NY 701-17P,C following the manufacturer's proportioning and mixing instructions printed on the package. Upon approval, the product brand name, manufacturing location and shelf life will be placed on the Approved List. The Department must receive a letter from the manufacturer annually certifying that no changes have been made in the formulation, manufacturing process, or manufacturing location. In the event that a letter is not received, the product may be removed from the Approved List. Furthermore, the material may be removed from the Approved List at any time if the Department is not notified in writing of any material changes as stated above. The Department reserves the right to sample and test the material at any time.

**BASIS OF ACCEPTANCE.** Products will be accepted on the basis of the brand name and manufacturing location appearing on the Approved List. Such products will then be accepted on the basis of the brand name and manufacturing location printed on the sealed, non reusable container along with the month and year (i.e. 05/2011) of when the material was manufactured. The manufacturer is required to print the shelf life on the container if it is less than 12 months. The expiration date of acceptance for this material shall be one calendar year from the date of manufacture or as stated in the Approved List, whichever is less.

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

Page 726 Under §701-09 **RAPID HARDENING CONCRETE REPAIR MATERIAL (Normal Weather)**, *delete* the section in its entirety, and *replace* it with the following:

**701-09 CONCRETE REPAIR MATERIAL - RAPID HARDENING**

**SCOPE.** This specification covers the requirements for material to repair portland cement concrete where rapid strength gain is required.

**GENERAL.** The use of this material is limited to areas no larger than 1 m<sup>2</sup> or 0.15 m<sup>3</sup> in volume for a single patch. This material is intended for partial or full depth repairs. This material may be extended with dried Department approved CA1 coarse aggregate. This product must provide the ability to accept traffic loads within 1 hour of placement. The Department will test the material neat except where noted in Table 701-09 to test neat and extended according to Test Method NY 701-21P,C following the manufacturer's proportioning and mixing instructions printed on the package. Material meeting the requirements of this specification when tested (Neat and Extended), will be placed on the Approved List.

**MATERIAL REQUIREMENTS.** This material shall be a prepackaged, multi-component powdered material, containing no metallic expansion aides, and must remain workable when a minimum of 60% extended by weight with Department approved CA1 coarse aggregate and meets the requirements of Table 701-09. When being used for aesthetic purposes the material's color shall be within the Munsell Neutral Scale range stated in Table 701-09.

| TABLE 701-09<br>CONCRETE REPAIR MATERIAL - RAPID HARDENING |      |      |
|------------------------------------------------------------|------|------|
| TEST REQUIREMENT                                           | Min. | Max. |
| Initial Set (minutes)                                      | 5    | -    |
| Expansion (%)                                              | -    | 0.4  |
| Contraction (%)                                            | -    | 0.0  |
| 1 Hour Compressive Strength (MPa)                          | 14   | -    |
| 3 Hour Compressive Strength (MPa) **                       | 21   | -    |
| 7 Day Compressive Strength (MPa)                           | 42   | -    |
| 1 Day Bond Strength (MPa)                                  | 1.5  | -    |
| Freeze-Thaw Loss % (25 cycles)**                           | -    | 1.0  |
| Total Chloride Content (% by weight)                       | -    | 0.05 |
| Total Sulfate Content (% by weight)                        | -    | 5.0  |
| Color, Munsell Neutral Scale                               | 4.0  | 8.5  |

\*\* Neat and Extended

**BASIS OF APPROVAL.** Application for material approval shall be submitted to the Materials Bureau by the manufacturer. The application shall be accompanied by a labeled 23 kg production sample of the product; however the Materials Bureau will approve other packaging quantities on a case-by-case basis. The Department will test the material according to Test Method NY 701-21P,C following the manufacturer's proportioning and mixing instructions printed on the package. Upon approval, the product brand name, manufacturing location and shelf life will be placed on the Approved List. The Department must receive a letter from the manufacturer annually certifying that no changes have been made in the formulation, manufacturing process, or manufacturing location. In the event that a letter is not received, the product may be removed from the Approved List. Furthermore, the material may be removed from the Approved List at any time if the Department is not notified in writing of any material changes as stated above. The Department reserves the right to sample and test the material at any time.

**BASIS OF ACCEPTANCE.** Products will be accepted on the basis of the brand name and manufacturing location appearing on the Approved List. Such products will then be accepted on the basis of the brand name and manufacturing location printed on the sealed, non reusable container along with the month and year (i.e. 05/2011) of when the material was manufactured. The manufacturer is required to print the shelf life on the container if it is less than 12 months. The expiration date of acceptance for this material shall be one calendar year from the date of manufacture or as stated in the Approved List, whichever is less.

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

Page 758 Under **§701-04 CONCRETE REPAIR MATERIAL**, *delete* the section in its entirety, and *replace* it with the following:

**701-04 CONCRETE REPAIR MATERIAL**

**SCOPE.** The material covered in this specification is generally used for shallow repairs of portland cement concrete, including repair of precast concrete products, such as pipe, cribbing, manholes, etc...

**GENERAL.** The use of this material is limited to repair areas smaller than 5 ft<sup>2</sup> and not deeper than 2 in. This material is meant to be applied and finished with a trowel in a horizontal position. The Department will test the material in accordance with Test Method NY 701-13P,C following the manufacturer's proportioning and mixing instructions printed on the package. Material meeting the requirements of this specification will be placed on the Approved List. For field use, follow the manufacturers mixing and curing recommendations.

**MATERIAL REQUIREMENTS.** The material shall be a prepackaged dry component: to which water or emulsified compound is added, used for concrete repair, containing no metallic expansion aides, to which no aggregate may be added, meeting the requirements of Table 701-04. When being used for aesthetic purposes the material's color shall be within the Munsell Neutral Scale range stated in Table 701-04:

| TABLE 701-04<br>CONCRETE REPAIR MATERIAL |      |      |
|------------------------------------------|------|------|
| TEST REQUIREMENT                         | Min. | Max. |
| Initial Set (minutes)                    | 10   | 60   |
| Expansion (%)                            | -    | 0.4  |
| Contraction (%)                          | -    | 0.0  |
| 1 Day Compressive Strength (psi)         | 3000 | -    |
| 7 Day Compressive Strength (psi)         | 5000 | -    |
| 28 Day Compressive Strength (psi)        | 6000 | -    |
| 1 Day Bond Strength (psi)                | 200  | -    |
| Freeze/Thaw Loss % (25 cycles)           | -    | 1.0  |
| Total Chloride Content (% by weight)     | -    | 0.05 |
| Total Sulfate Content (% by weight)      | -    | 5.0  |
| Color, Munsell Neutral Scale             | 4.0  | 8.5  |

**BASIS OF APPROVAL.** Application for material approval shall be submitted to the Materials Bureau by the manufacturer. The application shall be accompanied by a labeled 50 lb production sample of the product; however the Materials Bureau will approve other packaging quantities on a case-by-case basis. The Department will test the material according to Test Method NY 701-13P,C following the manufacturer's proportioning and mixing instructions printed on the package. Upon approval, the product brand name, manufacturing location and shelf life will be placed on the Approved List. The Department must receive a letter from the manufacturer annually certifying that no changes have been made in the formulation, manufacturing process, or manufacturing location. In the event that a letter is not received, the product may be removed from the Approved List. Furthermore, the material may be removed from the Approved List at any time if the Department is not notified in writing of any material changes as stated above. The Department reserves the right to sample and test the material at any time.

**BASIS OF ACCEPTANCE.** Products will be accepted on the basis of the brand name and manufacturing location appearing on the Approved List. Such products will then be accepted on the basis of the brand name and manufacturing location printed on the sealed, non reusable container along with the month and year (i.e. 05/2011) of when the material was manufactured. The manufacturer is required to print the shelf life on the container if it is less than 12 months. The expiration date of acceptance for this material shall be one calendar year from the date of manufacture or as stated in the Approved List, whichever is less.

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

Page 758 Under **§701-05 CONCRETE GROUTING MATERIAL**, *delete* the section in its entirety, and *replace* it with the following:

**701-05 CONCRETE GROUTING AND ANCHORING MATERIAL**

**SCOPE.** This specification covers the requirements for grouting material used to grout anchor bolts, dowels and other items in portland cement concrete. This material can also be used for forming mortar pads under bridge rail supports.

**GENERAL.** This material should not be used in layers thicker than 2 in. The Department will test the material according to Test Method NY 701-11P,C following the manufacturer's proportioning and mixing instructions printed on the package. Material meeting the requirements of this specification will be placed on the Approved List. For field use, follow the manufacturers mixing and curing recommendations.

**MATERIAL REQUIREMENTS.** The material shall be a prepackaged, dry component: to which water or emulsified compound is added, used for concrete repair, containing no metallic expansion aides, to which no aggregate may be added, meeting the requirements of Table 701-05.

| TABLE 701-05<br>CONCRETE GROUTING AND ANCHORING MATERIAL |       |      |
|----------------------------------------------------------|-------|------|
| TEST REQUIREMENT                                         | Min.  | Max. |
| Initial Set (minutes)                                    | 30    | -    |
| Expansion (%)                                            | -     | 0.4  |
| Contraction (%)                                          | -     | 0.0  |
| 1 Day Compressive Strength (psi)                         | 3000  | -    |
| 7 Day Compressive Strength (psi)                         | 6000  | -    |
| Pullout Strength (lbs)                                   | 10000 | -    |
| Freeze-Thaw Loss % (25 cycles)                           | -     | 1.0  |
| Total Chloride Content (% by weight)                     | -     | 0.05 |
| Total Sulfate Content (% by weight)                      | -     | 5.0  |

**BASIS OF APPROVAL.** Application for material approval shall be submitted to the Materials Bureau by the manufacturer. The application shall be accompanied by a labeled 50 lb production sample of the product; however the Materials Bureau will approve other packaging quantities on a case-by-case basis. The Department will test the material according to Test Method NY 701-11P,C following the manufacturer's proportioning and mixing instructions printed on the package. Upon approval, the product brand name, manufacturing location and shelf life will be placed on the Approved List. The Department must receive a letter from the manufacturer annually certifying that no changes have been made in the formulation, manufacturing process, or manufacturing location. In the event that a letter is not received, the product may be removed from the Approved List. Furthermore, the material may be removed from the Approved List at any time if the Department is not notified in writing of any material changes as stated above. The Department reserves the right to sample and test the material at any time.

**BASIS OF ACCEPTANCE.** Products will be accepted on the basis of the brand name and manufacturing location appearing on the Approved List. Such products will then be accepted on the basis of the brand name and manufacturing location printed on the sealed, non reusable container along with the month and year (i.e. 05/2011) of when the material was manufactured. The manufacturer is required to print the shelf life on the container if it is less than 12 months. The expiration date of acceptance for this material shall be one calendar year from the date of manufacture or as stated in the Approved List, whichever is less.

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

**Page 759 Under §701-06 CEMENT BASED GROUT MATERIALS FOR SHEAR KEYS,**  
~~delete~~ the section in its entirety, and **replace** it with the following:

#### 701-06 SHEAR KEY GROUT

**SCOPE.** This specification covers the requirements for grout to be placed in shear keys between precast concrete structural units.

**GENERAL.** The material must be flowable to fill the shear key with no voids. The Department will test the material in accordance with Test Method NY 701-12P,C following the manufacturer's proportioning and mixing instructions printed on the package. Material meeting the requirements of this specification will be placed on the Approved List. The Approved List titled: Shear Key Grout will state the precise water-grout ratio by weight. This ratio shall not be altered. For field use, follow the manufacturers mixing and curing recommendations.

**MATERIAL REQUIREMENTS.** The material shall be a prepackaged dry component: to which water or emulsified compound is added, used for concrete repair, containing no metallic expansion aides, to which no aggregate may be added. The material must meet the shear key pourability test as per Test Method NY 701-12P,C and the requirements of Table 701-06.

| TABLE 701-06<br>SHEAR KEY GROUT      |      |      |
|--------------------------------------|------|------|
| TEST REQUIREMENT                     | Min. | Max. |
| Initial Set (minutes)                | 120  | -    |
| Expansion (%)                        | 0.02 | 1.0  |
| Contraction (%)                      | -    | 0.0  |
| 7 Day Compressive Strength (psi)     | 6000 | -    |
| Freeze-Thaw Loss % (25 cycles)       | -    | 1.0  |
| Total Chloride Content (% by weight) | -    | 0.05 |
| Total Sulfate Content (% by weight)  | -    | 5.0  |

**BASIS OF APPROVAL.** Application for material approval shall be submitted to the Materials Bureau by the manufacturer. The application shall be accompanied by a labeled 50 lb production sample of the product; however the Materials Bureau will approve other packaging quantities on a case-by-case basis. The Department will test the material according to Test Method NY 701-12P,C following the manufacturer's proportioning and mixing instructions printed on the package. Upon approval, the product brand name, manufacturing location and shelf life will be placed on the Approved List. The Department must receive a letter from the manufacturer annually certifying that no changes have been made in the formulation, manufacturing process, or manufacturing location. In the event that a letter is not received, the product may be removed from the Approved List. Furthermore, the material may be removed from the Approved List at any time if the Department is not notified in writing of any material changes as stated above. The Department reserves the right to sample and test the material at any time.

**BASIS OF ACCEPTANCE.** Products will be accepted on the basis of the brand name and manufacturing location appearing on the Approved List. Such products will then be accepted on the basis of the brand name and manufacturing location printed on the sealed, non reusable container along with the month and year (i.e. 05/2011) of when the material was manufactured. The manufacturer is required to print the shelf life on the container if it is less than 12 months. The expiration date of acceptance for this material shall be one calendar year from the date of manufacture or as stated in the Approved List, whichever is less.

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

**Page 761 Under §701-08 VERTICAL AND OVERHEAD PATCHING MATERIAL, delete the section in its entirety, and *replace* it with the following:**

**701-08 VERTICAL AND OVERHEAD REPAIR MATERIAL**

**SCOPE.** This specification covers the requirements for Vertical and Overhead Repair Material for placement in structural concrete repairs.

**GENERAL.** The use of this material is limited to repair areas smaller than 4 ft<sup>2</sup> and not deeper than 2 in, and is meant to be applied and finished with a trowel. The Materials Bureau will consider other application techniques on a case by case basis. The Department will test the material in accordance with Test Method NY 701-17P,C following the manufacturer's proportioning and mixing instructions printed on the package. Material meeting the requirements of this specification will be placed on the Approved List. For field use, follow the manufacturers mixing and curing recommendations.

**MATERIAL REQUIREMENTS.** The material shall be a prepackaged dry component: to which water or emulsified compound is added, used for concrete repair, containing no metallic expansion aides, to which no aggregate may be added. The material shall be able to be placed in layers of at least 1 inch on overhead applications without the use of formwork or anchoring devices. When being used for aesthetic purposes the material's color shall be within the Munsell Neutral Scale range stated in Table 701-08.

| TABLE 701-08<br>VERTICAL AND OVERHEAD REPAIR MATERIAL |      |      |
|-------------------------------------------------------|------|------|
| TEST REQUIREMENT                                      | Min. | Max. |
| Initial Set (minutes)                                 | 15   | -    |
| Expansion (%)                                         | -    | 0.4  |
| Contraction (%)                                       | -    | 0.0  |
| 7 Day Compressive Strength (psi)                      | 4000 | -    |
| 28 Day Compressive Strength (psi)                     | 5000 |      |
| 1 Day Bond Strength (psi)                             | 200  | -    |
| Freeze-Thaw Loss % (25 cycles)                        | -    | 1.0  |
| Total Chloride Content (% by weight)                  | -    | 0.05 |
| Total Sulfate Content (% by weight)                   | -    | 5.0  |
| Color, Munsell Neutral Scale                          | 4.0  | 8.5  |

**BASIS OF APPROVAL.** Application for material approval shall be submitted to the Materials Bureau by the manufacturer. The application shall be accompanied by a labeled 50 lb production sample of the product; however the Materials Bureau will approve other packaging quantities on a case-by-case basis. The Department will test the material according to Test Method NY 701-17P,C following the manufacturer's proportioning and mixing instructions printed on the package. Upon approval, the product brand name, manufacturing location and shelf life will be placed on the Approved List. The Department must receive a letter from the manufacturer annually certifying that no changes have been made in the formulation, manufacturing process, or manufacturing location. In the event that a letter is not received, the product may be removed from the Approved List. Furthermore, the material may be removed from the Approved List at any time if the Department is not notified in writing of any material changes as stated above. The Department reserves the right to sample and test the material at any time.

**BASIS OF ACCEPTANCE.** Products will be accepted on the basis of the brand name and manufacturing location appearing on the Approved List. Such products will then be accepted on the basis of the brand name and manufacturing location printed on the sealed, non reusable container along with the month and year (i.e. 05/2011) of when the material was manufactured. The manufacturer is required to print the shelf life on the container if it is less than 12 months. The expiration date of acceptance for this material shall be one calendar year from the date of manufacture or as stated in the Approved List, whichever is less.

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

Page 762 Under §701-09 **RAPID HARDENING CONCRETE REPAIR MATERIAL (Normal Weather)**, *delete* the section in its entirety, and *replace* it with the following:

**701-09 CONCRETE REPAIR MATERIAL - RAPID HARDENING**

**SCOPE.** This specification covers the requirements for material to repair portland cement concrete where rapid strength gain is required.

**GENERAL.** Its use is limited to areas no larger than 10 ft<sup>2</sup> or 5 ft<sup>3</sup> in volume for a single patch. This material is intended for partial or full depth repairs. This material may be extended with dried Department approved CA1 coarse aggregate. This product must provide the ability to accept traffic loads within 1 hour of placement. The Department will test the material neat except where noted in Table 701-09 to test neat and extended according to Test Method NY 701-21P,C following the manufacturer's proportioning and mixing instructions printed on the package. Material meeting the requirements of this specification when tested (Neat and Extended), will be placed on the Approved List.

**MATERIAL REQUIREMENTS.** This material shall be a prepackaged, multi-component powdered material, containing no metallic expansion aides, and must remain workable when a minimum of 60% extended by weight with Department approved CA1 coarse aggregate and meets the requirements of Table 701-09. When being used for aesthetic purposes the material's color shall be within the Munsell Neutral Scale range stated in Table 701-09.

| TABLE 701-09<br>CONCRETE REPAIR MATERIAL - RAPID HARDENING |      |      |
|------------------------------------------------------------|------|------|
| TEST REQUIREMENT                                           | Min. | Max. |
| Initial Set (minutes)                                      | 5    | -    |
| Expansion (%)                                              | -    | 0.4  |
| Contraction (%)                                            | -    | 0.0  |
| 1 Hour Compressive Strength (psi)                          | 2000 | -    |
| 3 Hour Compressive Strength (psi) **                       | 3000 | -    |
| 7 Day Compressive Strength (psi)                           | 6000 | -    |
| 1 Day Bond Strength (psi)                                  | 200  | -    |
| Freeze-Thaw Loss % (25 cycles)**                           | -    | 1.0  |
| Total Chloride Content (% by weight)                       | -    | 0.05 |
| Total Sulfate Content (% by weight)                        | -    | 5.0  |
| Color, Munsell Neutral Scale                               | 4.0  | 8.5  |

\*\* Neat and Extended

**BASIS OF APPROVAL.** Application for material approval shall be submitted to the Materials Bureau by the manufacturer. The application shall be accompanied by a labeled 50 lb production sample of the product; however the Materials Bureau will approve other packaging quantities on a case-by-case basis. The Department will test the material according to Test Method NY 701-21P,C following the manufacturer's proportioning and mixing instructions printed on the package. Upon approval, the product brand name, manufacturing location and shelf life will be placed on the Approved List. The Department must receive a letter from the manufacturer annually certifying that no changes have been made in the formulation, manufacturing process, or manufacturing location. In the event that a letter is not received, the product may be removed from the Approved List. Furthermore, the material may be removed from the Approved List at any time if the Department is not notified in writing of any material changes as stated above. The Department reserves the right to sample and test the material at any time.

**BASIS OF ACCEPTANCE.** Products will be accepted on the basis of the brand name and manufacturing location appearing on the Approved List. Such products will then be accepted on the basis of the brand name and manufacturing location printed on the sealed, non reusable container along with the month and year (i.e. 05/2011) of when the material was manufactured. The manufacturer is required to print the shelf life on the container if it is less than 12 months. The expiration date of acceptance for this material shall be one calendar year from the date of manufacture or as stated in the Approved List, whichever is less.