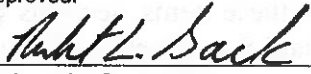


SUPERSEDED BY EB 15-031 EFFECTIVE 9/28/15		New York State Department of Transportation ENGINEERING BULLETIN	EI 10-022
Title: STANDARD SPECIFICATIONS – §704 MASONRY UNITS			
Distribution: ☒ Manufacturers (18) ☒ Local Govt. (31) ☒ Agencies (32) ☐ Surveyors (33) ☒ Consultants (34) ☒ Contractors (39) ()		Approved:  Robert L. Sack, P.E. Deputy Chief Engineer, Research 22 July 10 Date	

ADMINISTRATIVE INFORMATION:

- This Engineering Instruction (EI) is effective with the lettings of January 6, 2011.
- Superseded Issuances: This EI supersedes EI 08-032.
- This information will be included in the Section 704-Masonry Units of the Standard Specifications when it is re-issued.

PURPOSE: The purpose of this EI is to replace sections §704-02, §704-04, §704-07, §704-10, §704-12, §704-13 and §704-23 of the Standard Specifications.

TECHNICAL INFORMATION:

- This EI is being issued so that specifications conform to the requirements of Materials Procedure No. 09-03 Concrete Masonry Unit QC/QA Procedures. The “Basis of Acceptance”, “Compressive Strength”, “Friction” and “Alkali/Silica Reaction” requirements of the items covered under the above listed sections are revised.
- The revised sections reflect changes recently adopted by the Department related to the use of QC/QA procedures for material acceptance rather than stock lot acceptance.
- Department Staff shall use the attached information as guidance in administering provisions for all drycast masonry units.

IMPLEMENTATION:

- The Design Quality Assurance Bureau will insert the transmitted shelfnotes into contract proposals beginning with projects submitted for the letting of January 6, 2011.

TRANSMITTED MATERIALS: Both US Customary and Metric revisions to the Standard Specifications are attached.

BACKGROUND: The Materials Bureau has recently issued Materials Procedure No. 09-03 “Concrete Masonry Unit QC/QA Procedures”. This document addresses the basis of acceptance of all drycast concrete masonry items made under §704-02, §704-04, §704-07, §704-10, §704-12, §704-13 and §704-23 of the Standard Specifications. MP 09-03 deviates from the traditional “lot acceptance” Departmental policy for these items to a QC/QA based acceptance program. By adopting a QC/QA program, materials

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can be more readily available for project use. Material requirements have further been improved to address long term durability. A statement was also added in all above listed items raising Alkali/Silica Reaction and Material Requirements awareness to producers/manufacturers, contractors, other end-users and Department personnel. Also, previous friction requirements for §704-23 were amended in order to be compatible with the long standing friction requirements of §501-2.02 B. 2. Minimum compressive strength requirements for §704-04 (Concrete Block – Slope Paving) and §704-07 (Segmental Retaining Wall Blocks) were increased in the current issuance. Testing experience has demonstrated that units with lower compressive strength would usually fail to meet Department's freeze/thaw testing requirements. To accommodate these substantial changes in the Department's Basis of Acceptance philosophy and additional considerations for these items, sections §704-02, §704-04, §704-07, §704-10, §704-12, §704-13 and §704-23 of the Standard Specifications had to be revised.

CONTACT: Direct all questions regarding this EI to the Materials Bureau, attention of Don Streeter at dstreeter@dot.state.ny.us or (518) 457-4593 or Michael Mathioudakis at mmathioudakis@dot.state.ny.us or (518) 457 9800.

Section 704 – Masonry Units

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

Page 781, **remove** 704-02 in its entirety and **replace** it with the following:

“704-02 CONCRETE BRICK

SCOPE. This specification covers the material and quality requirements for concrete brick produced in accordance with the current Materials Procedure for Concrete Masonry QC/QA titled “Procedures for Achieving and Maintaining Concrete Masonry Units Approved List Status”. Item 704-02 can be used in brick masonry construction, altering drainage structures, leaching-basins and manholes (section 604).

MATERIAL REQUIREMENTS. Concrete brick shall conform to the requirements of ASTM C936, except as noted herein. Certain aggregates appear in the Approved List of Sources of Fine and Coarse Aggregates that have use limitations with high alkali Portland Cement. Materials used in the manufacture of concrete brick shall meet the requirements of the following subsections:

Portland Cement	701-01
Coarse Aggregate	703-02
Mortar Sand	703-03
Grout Sand	703-04
Concrete Sand	703-07
Fly Ash	711-10
Ground, Granulated Blast-Furnace Slag	711-12
Water	712-01

Fly ash or ground, granulated blast-furnace slag may be substituted up to a maximum of 20% by weight of the total amount of cement plus pozzolan in the mix. Pigments used for integral coloring shall meet the requirements of ASTM C979. Other materials may be used in the manufacture as approved by the Director, Materials Bureau. The nominal dimensions of the brick shall be 8 inches long, 4 inches wide, and 2 $\frac{3}{8}$ inches in height.

Physical Properties. Concrete brick shall meet the compressive strength and absorption requirements in ASTM C936. In addition, the maximum acceptable average freeze/thaw loss of five paver samples, subjected to 25 freeze/thaw cycles in a 10% NaCl solution, is 1.0%, with no individual sample exceeding 1.5%.

SAMPLING AND TESTING. When samples are requested by the Department, they will be randomly selected from production-run material. A total of 15 concrete bricks of the same size and style will be required. Five samples will be tested for compressive strength and five for absorption, in accordance with ASTM C140. Five samples will be tested for freeze/thaw durability in accordance with NYSDOT test methods.

BASIS OF ACCEPTANCE. Concrete brick will be accepted on the job site based on the following:

- The manufacturer's name must appear on the Department's Approved List for the item being supplied.
- A manufacturer's certification.
- An acceptable product evaluation made by the Engineer.”

Section 704 – Masonry Units

Page 788, remove 704-04 in its entirety and replace with the following:

"704-04 CONCRETE BLOCK (SLOPE PAVING)

SCOPE. This specification covers the material details and quality requirements for concrete block for use in concrete block slope paving and produced in accordance with the current Materials Procedure for Concrete Masonry QC/QA titled "Procedures for Achieving and Maintaining Concrete Masonry Units Approved List Status".

MATERIAL REQUIREMENTS. Certain aggregates appear in the Approved List of Sources of Fine and Coarse Aggregates that have use limitations with high alkali Portland Cement. Materials used in the manufacture of concrete block shall meet the requirements of the following subsections:

Portland Cement	701-01
Coarse Aggregate	703-02
Mortar Sand	703-03
Grout Sand	703-04
Concrete Sand	703-07
Fly Ash	711-10
Ground, Granulated Blast-Furnace Slag	711-12
Water	712-01

Fly ash or ground granulated blast furnace slag may be substituted for up to a maximum of 20% by weight of the total amount of cement plus pozzolan in the mix. Pigments used for integral coloring shall meet the requirements of ASTM C979. Other materials may be used in the manufacture as approved by the Director, Materials Bureau.

Physical Properties. The minimum acceptable average compressive strength of five-block samples is 6000 psi, with no individual block less than 5500 psi. The maximum acceptable average freeze/thaw loss of five-block samples, subjected to 42 freeze/thaw cycles in a 3% NaCl solution, shall not exceed 1.0%, with no individual sample exceeding 1.5%.

Block dimensions shall be as required in the contract documents. Dimensions shall not vary by more than $\frac{1}{4}$ inch from those specified. Blocks shall be sound and free from cracks or other defects that would interfere with their proper placement or performance.

SAMPLING AND TESTING. When samples are requested by the Department, they will be randomly selected from production-run material. A minimum of five samples, prepared by the manufacturer in accordance with ASTM C1262, will be required for freeze/thaw testing.

Samples will be tested for compressive strength in accordance with ASTM C140. Samples will be tested for freeze/thaw durability in accordance with ASTM C1262.

BASIS OF ACCEPTANCE. Concrete block will be accepted on the job site based on the following:

- The manufacturer's name must appear on the Department's Approved List for the item being supplied.
- A manufacturer's certification.
- An acceptable product evaluation made by the Engineer."

Section 704 – Masonry Units

Page 790, **remove** 704-07 in its entirety and **replace** with the following:

“704-07 SEGMENTAL RETAINING WALL BLOCKS

SCOPE. This specification covers the material details and quality requirements for segmental retaining wall blocks produced in accordance with the current Materials Procedure for Concrete Masonry QC/QA titled “Procedures for Achieving and Maintaining Concrete Masonry Units Approved List Status”.

MATERIAL REQUIREMENTS. Provide segmental retaining wall block meeting the style and color requirements in the contract documents. Certain aggregates appear in the Approved List of Sources of Fine and Coarse Aggregates that have use limitations with high alkali Portland cement. Use materials, meeting the following requirements, in the manufacture of segmental retaining wall blocks:

Portland Cement	701-01
Coarse Aggregate	703-02
Mortar Sand	703-03
Grout Sand	703-04
Concrete Sand	703-07
Fly Ash	711-10
Ground, Granulated Blast-Furnace Slag	711-12
Water	712-01

Fly ash or ground, granulated blast-furnace slag may be substituted for up to a maximum of 20% by weight of the total amount of cement plus pozzolan in the mix. Use integral coloring pigments, when required, meeting the requirements of ASTM C979. Other materials may be used in the manufacture as approved by the Director, Materials Bureau.

Physical Properties. The minimum acceptable average compressive strength of five-block samples is 6000 psi, with no individual block sample less than 5500 psi. The maximum acceptable average freeze/thaw loss of five-block samples, subjected to 42 freeze/thaw cycles in a 3% NaCl solution, is 1.0%, with no individual sample exceeding 1.5%.

The formed dimensions of concrete retaining wall block units will not differ more than ¼ inch from the nominal dimensions shown on the approved Materials Detail Drawing. Provide sound blocks, free from cracks or other defects that would interfere with the proper placing, performance, or appearance of the blocks.

Materials Details. At the time of application to the Approved List, submit Materials Details Drawings to the Director, Materials Bureau for approval. Prepare and submit drawings in accordance with Departmental procedural directives. Submit a unique drawing(s) for each block style under consideration.

SAMPLING AND TESTING. When samples are requested by the Department, they will be randomly selected from production-run material. A minimum of 5 samples, prepared by the manufacturer in accordance with ASTM C140, will be required for compression testing. A minimum of five samples, prepared by the manufacturer in accordance with ASTM C1262, will be required for freeze/thaw testing.

Samples will be tested for compressive strength in accordance with ASTM C140. Samples will be tested for freeze/thaw durability in accordance with ASTM C1262.

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BASIS OF ACCEPTANCE. Segmental retaining wall blocks will be accepted on the job site based on the following:

- The manufacturer's name and block style must appear on the Department's Approved List for the item being supplied.
- A manufacturer's certification.
- Conformance to the approved material detail drawing(s).
- An acceptable product evaluation made by the Engineer."

Page 792, **remove** 704-10 in its entirety and **replace** with the following:

"704-10 SPLIT-FACED CONCRETE BRICK

SCOPE. This specification covers the material details and quality requirements for split faced concrete brick for use in facing structural walls and produced in accordance with the current Materials Procedure for Concrete Masonry QC/QA titled "Procedures for Achieving and Maintaining Concrete Masonry Units Approved List Status".

MATERIAL REQUIREMENTS. Split-faced concrete brick shall conform to the requirements of ASTM C90, except as noted herein. The shape, size, and color of split-faced concrete brick shall be as shown in the contract documents. The splitting operation shall leave relatively sharp, straight and parallel edges. Certain aggregates appear in the Approved List of Sources of Fine and Coarse Aggregates that have use limitations with high alkali Portland Cement. Materials used in the manufacture of split-faced concrete brick shall meet the requirements of the following subsections:

Portland Cement	701-01
Coarse Aggregate	703-02
Mortar Sand	703-03
Grout Sand	703-04
Concrete Sand	703-07
Fly Ash	711-10
Ground, Granulated Blast-Furnace Slag	711-12
Water	712-01

Fly ash or ground, granulated blast-furnace slag may be substituted for up to a maximum of 20% by weight of the total amount of cement plus pozzolan in the mix. Pigments used for integral coloring shall meet the requirements of ASTM C979. Other materials may be used in the manufacture as approved by the Director, Materials Bureau.

SAMPLING AND TESTING. When samples are requested by the Department, they will be randomly selected from production-run material. A minimum of 10 full-size, split-faced bricks of the same size and style will be required. Five samples will be tested for compressive strength and five for absorption, in accordance with ASTM C140.

The manufacturer shall be responsible for having brick tested for linear drying shrinkage in accordance with ASTM C90. A copy of the test report shall be included with the samples submitted to the Department for compression and absorption testing.

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BASIS OF ACCEPTANCE. Split-faced concrete brick will be accepted on the job site based on the following:

- The manufacturer's name must appear on the Department's Approved List for the item being supplied.
- A manufacturer's certification.
- An acceptable product evaluation made by the Engineer."

Page 793, **remove** 704-12 in its **entirety** and replace with the following:

"704-12 CONCRETE BLOCK

SCOPE. This specification covers the material and quality requirements for concrete block for use in structural walls and produced in accordance with the current Materials Procedure for Concrete Masonry QC/QA titled "Procedures for Achieving and Maintaining Concrete Masonry Units Approved List Status".

MATERIAL REQUIREMENTS. Concrete block shall conform to the requirements of ASTM C90 except as noted herein. The shape, size, and color of concrete block shall be as shown in the contract documents. Certain aggregates appear in the Approved List of Sources of Fine and Coarse Aggregates that have use limitations with high alkali Portland Cement. Materials used in the manufacture of concrete block shall meet the requirements of the following subsections:

Portland Cement	701-01
Coarse Aggregate	703-02
Mortar Sand	703-03
Grout Sand	703-04
Concrete Sand	703-07
Fly Ash	711-10
Ground, Granulated Blast-Furnace Slag	711-12
Water	712-01

Fly ash or ground, granulated blast-furnace slag may be substituted for up to a maximum of 20% by weight of the total amount of cement plus pozzolan in the mix. Pigments used for integral coloring shall meet the requirements of ASTM C979. Other materials may be used in the manufacture as approved by the Director, Materials Bureau.

SAMPLING AND TESTING. When samples are requested by the Department, they will be randomly selected from production-run material. A minimum of 10 full-size concrete blocks of the same size and style will be required. Five samples will be tested for compressive strength and five for absorption, in accordance with ASTM C140.

The manufacturer shall be responsible for having block tested for linear drying shrinkage in accordance with ASTM C90. A copy of the test report shall be included with the samples submitted to the Department for compression and absorption testing.

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BASIS OF ACCEPTANCE. Concrete block will be accepted on the job site based on the following:

- The manufacturer's name must appear on the Department's Approved List for the item being supplied.
- A manufacturer's certification.
- An acceptable product evaluation made by the Engineer."

Page 794, **remove** 704-13 in its entirety and **replace** with the following:

"704-13 PRECAST CONCRETE DRIVEWAY AND SIDEWALK PAVERS

SCOPE. This specification covers the material details and quality requirements for precast concrete pavers used for driveway and sidewalk paving and produced in accordance with the current Materials Procedure for Concrete Masonry QC/QA titled "Procedures for Achieving and Maintaining Concrete Masonry Units Approved List Status".

MATERIAL REQUIREMENTS. Precast concrete pavers shall meet the requirements of ASTM C936 except as noted herein. The shape, size, and color of precast concrete pavers shall be as shown in the Contract documents. Certain aggregates appear in the Approved List of Sources of Fine and Coarse Aggregates that have use limitations with high alkali Portland Cement. Materials used in the manufacture of precast concrete pavers shall meet the requirements of the following subsections:

Portland Cement	701-01
Coarse Aggregate	703-02
Mortar Sand	703-03
Grout Sand	703-04
Concrete Sand	703-07
Fly Ash	711-10
Ground, Granulated Blast-Furnace Slag	711-12
Water	712-01

Fly ash or ground, granulated blast-furnace slag may be substituted for up to a maximum of 20% by weight of the total amount of cement plus pozzolan in the mix. Pigments used for integral coloring shall meet the requirements of ASTM C979. Other materials may be used in the manufacture as approved by the Director, Materials Bureau.

Physical Properties. Precast concrete pavers shall meet the compressive strength and absorption requirements of ASTM C936. In addition, the maximum acceptable average freeze/thaw loss of five paver samples, subjected to 25 freeze/thaw cycles in a 10% NaCl solution, is 1.0%, with no individual sample exceeding 1.5%.

SAMPLING AND TESTING. When samples are requested by the Department, they will be randomly selected from production-run material. A total of 15 precast concrete pavers of the same size and style will be required. Five samples will be tested for compressive strength and five for absorption, in accordance with ASTM C140. Five samples will be tested for freeze/thaw durability in accordance with NYSDOT test methods.

Section 704 – Masonry Units

BASIS OF ACCEPTANCE. Precast concrete driveway and sidewalk pavers will be accepted on the job site based on the following:

- The manufacturer's name must appear on the Department's Approved List for the item being supplied.
- A manufacturer's certification.
- An acceptable product evaluation made by the Engineer."

Page 798, **remove** 704-23 in its entirety and **replace** with the following:

"704-23 PRECAST CONCRETE STREET PAVERS

SCOPE. This specification covers the material and quality requirements for precast concrete pavers used for street paving and produced in accordance with the current Materials Procedure for Concrete Masonry QC/QA titled "Procedures for Achieving and Maintaining Concrete Masonry Units Approved List Status".

MATERIAL REQUIREMENTS. Precast concrete pavers shall meet the requirements of ASTM C936 except as noted herein. The shape, size, and color of precast concrete pavers shall be as shown in the contract documents. Minimum thickness for precast concrete street pavers shall be 3 1/8 inches. Certain aggregates appear in the Approved List of Sources of Fine and Coarse Aggregates that have use limitations with high alkali Portland cement. Materials used in the manufacturing of precast concrete pavers shall meet the requirements of the following subsections:

Portland Cement	701-01
Coarse Aggregate*	703-02
Mortar Sand*	703-03
Grout Sand*	703-04
Concrete Sand*	703-07
Fly Ash	711-10
Ground, Granulated Blast-Furnace Slag	711-12
Water	712-01

* **Aggregates.** For precast concrete pavers or equivalent products placed in concrete highway wearing surfaces, use aggregate from a source or sources on the "Approved List of Sources of Fine and Coarse Aggregate." All aggregate must be approved for use in concrete. Fine aggregate, natural or manufactured sand, must meet the requirements of §703-01, Fine Aggregate. Crushed stone, crushed gravel, or crushed slag from a coarse aggregate source must meet the requirements of §703-02, Coarse Aggregate.

Aggregate friction requirements: Sample and test aggregate for friction characteristics according to the procedures of Materials Method 28 "Friction Aggregate Control and Test Procedures", PCC Sand. The Engineer will identify pavement areas, if any, represented by failing samples according to the procedures of Materials Method 28 "Friction Aggregate Control and Test Procedures."

Aggregate must contain at least 25.0% acid-insoluble residue in the plus No. 30 size fraction and in the minus No. 30, plus No. 200 size fraction. If more than one source of aggregate is used, aggregate from each source must meet the acid-insoluble residue requirements.

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Fly ash or ground, granulated blast-furnace slag may be substituted up to a maximum of 20% by weight of the total amount of cement plus pozzolan in the mix. Pigments used for integral coloring shall meet the requirements of ASTM C979. Other materials may be used in the manufacture as approved by the Director, Materials Bureau.

Physical Properties. Precast concrete pavers shall meet the compressive strength and absorption requirements of ASTM C936. In addition, the maximum acceptable average freeze/thaw loss of five paver samples, subjected to 25 freeze/thaw cycles in a 10% NaCl solution, is 1.0%, with no individual sample exceeding 1.5%.

SAMPLING AND TESTING. When samples are requested by the Department, they will be randomly selected from production-run material. A total of 15 precast concrete pavers of the same size and style will be required. Five samples will be tested for compressive strength and five for absorption, in accordance with ASTM C140. Five samples will be tested for freeze/thaw durability in accordance with NYSDOT test methods.

BASIS OF ACCEPTANCE. Precast Concrete Street pavers will be accepted on the job site based on the following:

- The manufacturer's name must appear on the Department's Approved List for the item being supplied.
- A manufacturer's certification.
- An acceptable product evaluation made by the Engineer."

Section 704 – Masonry Units

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

Page 743, **remove** 704-02 in its entirety and **replace** with the following:

“704-02 CONCRETE BRICK

SCOPE. This specification covers the material details and quality requirements for concrete brick produced in accordance with the current Materials Procedure for Concrete Masonry QC/QA titled “Procedures for Achieving and Maintaining Concrete Masonry Units Approved List Status”. Item 704-02 can be used in brick masonry construction, altering drainage structures, leaching-basins and manholes (section 604).

MATERIAL REQUIREMENTS. Concrete brick shall conform to the requirements of ASTM C936, except as noted herein. Certain aggregates appear in the Approved List of Sources of Fine and Coarse Aggregates that have use limitations with high alkali Portland cement. Materials used in the manufacture of concrete brick shall meet the requirements of the following subsections:

Portland Cement	701-01
Coarse Aggregate	703-02
Mortar Sand	703-03
Grout Sand	703-04
Concrete Sand	703-07
Fly Ash	711-10
Ground, Granulated Blast-Furnace Slag	711-12
Water	712-01

Fly ash or ground, granulated blast-furnace slag may be substituted up to a maximum of 20% by weight of the total amount of cement plus pozzolan in the mix. Pigments used for integral coloring shall meet the requirements of ASTM C979. Other materials may be used in the manufacture as approved by the Director, Materials Bureau. The nominal dimensions of the brick shall be 200 mm long, 100 mm wide, and 68 mm in height.

Physical Properties. Concrete brick shall meet the compressive strength and absorption requirements in ASTM C936. In addition, the maximum acceptable average freeze/thaw loss of five paver samples, subjected to 25 freeze/thaw cycles in a 10% NaCl solution, is 1.0%, with no individual sample exceeding 1.5%.

SAMPLING AND TESTING. When samples are requested by the Department, they will be randomly selected from production-run material. A total of 15 concrete bricks of the same size and style will be required. Five samples will be tested for compressive strength and five for absorption, in accordance with ASTM C140. Five samples will be tested for freeze/thaw durability in accordance with NYSDOT test methods.

BASIS OF ACCEPTANCE. Concrete brick will be accepted on the job site based on the following:

- The manufacturer's name must appear on the Department's Approved List for the item being supplied.
- A manufacturer's certification.
- An acceptable product evaluation made by the Engineer.”

Section 704 – Masonry Units

Page 750, remove 704-04 in its entirety and replace with the following:

“704-04 CONCRETE BLOCK (SLOPE PAVING)

SCOPE. This specification covers the material details and quality requirements for solid concrete block for use in concrete block slope paving and produced in accordance with the current Materials Procedure for Concrete Masonry QC/QA titled “Procedures for Achieving and Maintaining Concrete Masonry Units Approved List Status”.

MATERIAL REQUIREMENTS. Certain aggregates appear in the Approved List of Sources of Fine and Coarse Aggregates that have use limitations with high alkali Portland Cement. Materials used in the manufacture of concrete block shall meet the requirements of the following subsections:

Portland Cement	701-01
Coarse Aggregate	703-02
Mortar Sand	703-03
Grout Sand	703-04
Concrete Sand	703-07
Fly Ash	711-10
Ground, Granulated Blast-Furnace Slag	711-12
Water	712-01

Fly ash or ground granulated blast furnace slag may be substituted for up to a maximum of 20% by weight of the total amount of cement plus pozzolan in the mix. Pigments used for integral coloring shall meet the requirements of ASTM C979. Other materials may be used in the manufacture as approved by the Director, Materials Bureau.

Physical Properties. The minimum acceptable average compressive strength of five-block samples is 41.5 MPa, with no individual block less than 38 MPa. The maximum acceptable average freeze/thaw loss of five-block samples, subjected to 42 freeze/thaw cycles in a 3% NaCl solution, shall not exceed 1.0%, with no individual sample exceeding 1.5%.

Block dimensions shall be as required in the contract documents. Dimensions shall not vary by more than 6 mm from those specified. Blocks shall be sound and free from cracks or other defects that would interfere with their proper placement or performance.

SAMPLING AND TESTING. When samples are requested by the Department, they will be randomly selected from production-run material. A minimum of five samples, prepared by the manufacturer in accordance with ASTM C1262, will be required for freeze/thaw testing.

Samples will be tested for compressive strength in accordance with ASTM C140. Samples will be tested for freeze/thaw durability in accordance with ASTM C1262.

BASIS OF ACCEPTANCE. Concrete block will be accepted on the job site based on the following:

- The manufacturer's name must appear on the Department's Approved List for the item being supplied.
- A manufacturer's certification.
- An acceptable product evaluation made by the Engineer.”

Section 704 – Masonry Units

Page 752, **remove** 704-07 in its entirety and **replace** with the following:

“704-07 SEGMENTAL RETAINING WALL BLOCKS

SCOPE. This specification covers the material details and quality requirements for segmental retaining wall block produced in accordance with the current Materials Procedure for Concrete Masonry QC/QA titled “Procedures for Achieving and Maintaining Concrete Masonry Units Approved List Status”.

MATERIAL REQUIREMENTS. Provide segmental retaining wall block meeting the style and color requirements in the contract documents. Certain aggregates appear in the Approved List of Sources of Fine and Coarse Aggregates that have use limitations with high alkali Portland Cement. Use materials, meeting the following requirements, in the manufacture of segmental retaining wall blocks:

Portland Cement	701-01
Coarse Aggregate	703-02
Mortar Sand	703-03
Grout Sand	703-04
Concrete Sand	703-07
Fly Ash	711-10
Ground, Granulated Blast-Furnace Slag	711-12
Water	712-01

Fly ash or ground, granulated blast-furnace slag may be substituted for up to a maximum of 20% by weight of the total amount of cement plus pozzolan in the mix. Use integral coloring pigments, when required, meeting the requirements of ASTM C979. Other materials may be used in the manufacture as approved by the Director, Materials Bureau.

Physical Properties. The minimum acceptable average compressive strength of five-block samples is 41.5 MPa, with no individual block sample less than 38 MPa. The maximum acceptable average freeze / thaw loss of five-block samples, subjected to 42 freeze/thaw cycles in a 3% NaCl solution, is 1.0%, with no individual sample exceeding 1.5%.

The formed dimensions of concrete retaining wall block units will not differ more than 6 mm from the nominal dimensions shown on the approved Materials Detail Drawing. Provide sound blocks, free from cracks or other defects that would interfere with the proper placing, performance, or appearance of the blocks.

Materials Details. At the time of application to the Approved List, submit Materials Details Drawings to the Director, Materials Bureau for approval. Prepare and submit drawings in accordance with Departmental procedural directives. Submit a unique drawing(s) for each block style under consideration.

SAMPLING AND TESTING. When samples are requested by the Department, they will be randomly selected from production-run material. A minimum of 5 samples, prepared by the manufacturer in accordance with ASTM C140, will be required for compression testing. A minimum of five samples, prepared by the manufacturer in accordance with ASTM C1262, will be required for freeze/thaw testing.

Samples will be tested for compressive strength in accordance with ASTM C140. Samples will be tested for freeze/thaw durability in accordance with ASTM C1262.

Section 704 – Masonry Units

BASIS OF ACCEPTANCE. Segmental retaining wall blocks will be accepted on the job site based on the following:

- The manufacturer's name and block style must appear on the Department's Approved List for the item being supplied.
- A manufacturer's certification.
- Conformance to the approved material detail drawing(s).
- An acceptable product evaluation made by the Engineer."

Page 754, **remove** 704-10 in its entirety and **replace** with the following:

"704-10 SPLIT-FACED CONCRETE BRICK

SCOPE. This specification covers the material and quality requirements for split faced concrete brick for use in facing structural walls and produced in accordance with the current Materials Procedure for Concrete Masonry QC/QA titled "Procedures for Achieving and Maintaining Concrete Masonry Units Approved List Status".

MATERIAL REQUIREMENTS. Split-faced concrete brick shall conform to the requirements of ASTM C90, except as noted herein. The shape, size, and color of split-faced concrete brick shall be as shown in the contract documents. The splitting operation shall leave relatively sharp, straight and parallel edges. Certain aggregates appear in the Approved List of Sources of Fine and Coarse Aggregates that have use limitations with high alkali Portland cement. Materials used in the manufacture of split-faced concrete brick shall meet the requirements of the following subsections:

Portland Cement	701-01
Coarse Aggregate	703-02
Mortar Sand	703-03
Grout Sand	703-04
Concrete Sand	703-07
Fly Ash	711-10
Ground, Granulated Blast-Furnace Slag	711-12
Water	712-01

Fly ash or ground, granulated blast-furnace slag may be substituted for up to a maximum of 20% by weight of the total amount of cement plus pozzolan in the mix. Pigments used for integral coloring shall meet the requirements of ASTM C979. Other materials may be used in the manufacture as approved by the Director, Materials Bureau.

SAMPLING AND TESTING. When samples are requested by the Department, they will be randomly selected from production-run material. A minimum of 10 full-size, split-faced bricks of the same size and style will be required. Five samples will be tested for compressive strength and five for absorption, in accordance with ASTM C140.

The manufacturer shall be responsible for having brick tested for linear drying shrinkage in accordance

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with ASTM C90. A copy of the test report shall be included with the samples submitted to the Department for compression and absorption testing.

BASIS OF ACCEPTANCE. Split-faced concrete brick will be accepted on the job site based on the following:

- The manufacturer's name must appear on the Department's Approved List for the item being supplied.
- A manufacturer's certification.
- An acceptable product evaluation made by the Engineer."

Page 755, **remove** 704-12 in its entirety and **replace** with the following:

"704-12 CONCRETE BLOCK

SCOPE. This specification covers the material and quality requirements for concrete block produced in accordance with the current Materials Procedure for Concrete Masonry QC/QA titled "Procedures for Achieving and Maintaining Concrete Masonry Units Approved List Status". This specification covers the material and quality requirements for concrete block for use in structural walls.

MATERIAL REQUIREMENTS. Concrete block shall conform to the requirements of ASTM C90 except as noted herein. The shape, size, and color of concrete block shall be as shown in the contract documents. Certain aggregates appear in the Approved List of Sources of Fine and Coarse Aggregates that have use limitations with high alkali Portland cement. Materials used in the manufacture of concrete block shall meet the requirements of the following subsections:

Portland Cement	701-01
Coarse Aggregate	703-02
Mortar Sand	703-03
Grout Sand	703-04
Concrete Sand	703-07
Fly Ash	711-10
Ground, Granulated Blast-Furnace Slag	711-12
Water	712-01

Fly ash or ground, granulated blast-furnace slag may be substituted for up to a maximum of 20% by weight of the total amount of cement plus pozzolan in the mix. Pigments used for integral coloring shall meet the requirements of ASTM C979. Other materials may be used in the manufacture as approved by the Director, Materials Bureau.

SAMPLING AND TESTING. When samples are requested by the Department, they will be randomly selected from production-run material. A minimum of 10 full-size concrete blocks of the same size and style will be required. Five samples will be tested for compressive strength and five for absorption, in accordance with ASTM C140.

The manufacturer shall be responsible for having block tested for linear drying shrinkage in accordance with ASTM C90. A copy of the test report shall be included with the samples submitted to the

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Department for compression and absorption testing.

BASIS OF ACCEPTANCE. Concrete block will be accepted on the job site based on the following:

- The manufacturer's name must appear on the Department's Approved List for the item being supplied.
- A manufacturer's certification.
- An acceptable product evaluation made by the Engineer."

Page 756, **remove** 704-13 in its entirety and **replace** with the following:

"704-13 PRECAST CONCRETE DRIVEWAY AND SIDEWALK PAVERS

SCOPE. This specification covers the material and quality requirements for precast concrete pavers used for driveway and sidewalk paving and produced in accordance with the current Materials Procedure for Concrete Masonry QC/QA titled "Procedures for Achieving and Maintaining Concrete Masonry Units Approved List Status".

MATERIAL REQUIREMENTS. Precast concrete pavers shall meet the requirements of ASTM C936 except as noted herein. The shape, size, and color of precast concrete pavers shall be as shown in the Contract documents. Certain aggregates appear in the Approved List of Sources of Fine and Coarse Aggregates that have use limitations with high alkali Portland cement. Materials used in the manufacture of precast concrete pavers shall meet the requirements of the following subsections:

Portland Cement	701-01
Coarse Aggregate	703-02
Mortar Sand	703-03
Grout Sand	703-04
Concrete Sand	703-07
Fly Ash	711-10
Ground, Granulated Blast-Furnace Slag	711-12
Water	712-01

Fly ash or ground, granulated blast-furnace slag may be substituted for up to a maximum of 20% by weight of the total amount of cement plus pozzolan in the mix. Pigments used for integral coloring shall meet the requirements of ASTM C979. Other materials may be used in the manufacture as approved by the Director, Materials Bureau.

Physical Properties. Precast concrete pavers shall meet the compressive strength and absorption requirements of ASTM C936. In addition, the maximum acceptable average freeze/thaw loss of five paver samples, subjected to 25 freeze/thaw cycles in a 10% NaCl solution, is 1.0%, with no individual sample exceeding 1.5%.

SAMPLING AND TESTING. When samples are requested by the Department, they will be randomly selected from production-run material. A total of 15 precast concrete pavers of the same size and style will be required. Five samples will be tested for compressive strength and five for absorption, in accordance with ASTM C140. Five samples will be tested for freeze/thaw durability in accordance with

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NYSDOT test methods.

BASIS OF ACCEPTANCE. Precast concrete driveway and sidewalk pavers will be accepted on the job site based on the following:

- The manufacturer's name must appear on the Department's Approved List for the item being supplied.
- A manufacturer's certification.
- An acceptable product evaluation made by the Engineer."

Page 758, **remove** 704-23 in its entirety and **replace** with the following:

"704-23 PRECAST CONCRETE STREET PAVERS

SCOPE. This specification covers the material and quality requirements for precast concrete pavers used for street paving and produced in accordance with the current Materials Procedure for Concrete Masonry QC/QA titled "Procedures for Achieving and Maintaining Concrete Masonry Units Approved List Status".

MATERIAL REQUIREMENTS. Precast concrete pavers shall meet the requirements of ASTM C936 except as noted herein. The shape, size, and color of precast concrete pavers shall be as shown in the contract documents. Minimum thickness for precast concrete street pavers shall be 80 mm. Certain aggregates appear in the Approved List of Sources of Fine and Coarse Aggregates that have use limitations with high alkali Portland cement. Materials used in the manufacturing of precast concrete pavers shall meet the requirements of the following subsections:

Portland Cement	701-01
Coarse Aggregate*	703-02
Mortar Sand*	703-03
Grout Sand*	703-04
Concrete Sand*	703-07
Fly Ash	711-10
Ground, Granulated Blast-Furnace Slag	711-12
Water	712-01

* **Aggregates.** For precast concrete pavers or equivalent products placed in concrete highway wearing surfaces, use aggregate from a source or sources on the "Approved List of Sources of Fine and Coarse Aggregate." All aggregate must be approved for use in concrete. Fine aggregate, natural or manufactured sand, must meet the requirements of §703-01, Fine Aggregate. Crushed stone, crushed gravel, or crushed slag from a coarse aggregate source must meet the requirements of §703-02, Coarse Aggregate.

Aggregate friction requirements: Sample and test aggregate for friction characteristics according to the procedures of Materials Method 28 "Friction Aggregate Control and Test Procedures", PCC Sand. The Engineer will identify pavement areas, if any, represented by failing samples according to the procedures of Materials Method 28 "Friction Aggregate Control and Test Procedures."

Aggregate must contain at least 25% acid-insoluble residue in the plus No. 30 size fraction and in the

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minus No. 30, plus No. 200 size fraction. If more than one source of aggregate is used, aggregate from each source must meet the acid-insoluble residue requirements.

Fly ash or ground, granulated blast-furnace slag may be substituted up to a maximum of 20% by weight of the total amount of cement plus pozzolan in the mix. Pigments used for integral coloring shall meet the requirements of ASTM C979. Other materials may be used in the manufacture as approved by the Director, Materials Bureau.

Physical Properties. Precast concrete pavers shall meet the compressive strength and absorption requirements of ASTM C936. In addition, the maximum acceptable average freeze/thaw loss of five paver samples, subjected to 25 freeze/thaw cycles in a 10% NaCl solution, is 1.0%, with no individual sample exceeding 1.5%.

SAMPLING AND TESTING. When samples are requested by the Department, they will be randomly selected from production-run material. A total of 15 precast concrete pavers of the same size and style will be required. Five samples will be tested for compressive strength and five for absorption, in accordance with ASTM C140. Five samples will be tested for freeze/thaw durability in accordance with NYSDOT test methods.

BASIS OF ACCEPTANCE. Precast Concrete Street pavers will be accepted on the job site based on the following:

- The manufacturer's name must appear on the Department's Approved List for the item being supplied.
- A manufacturer's certification.
- An acceptable product evaluation made by the Engineer."