This Specification covers minimum requirements for the construction of pervious concrete pavement. This Specification covers materials, preparation, forming, placing, finishing, jointing, curing, and quality control of pervious concrete pavement. Provisions governing testing, evaluation, and acceptance of pervious concrete pavement are included.

Keywords: construction; curing; inspection; jointing; parking lots; testing.
1.2—Interpretation
1.3—Definitions
1.4—Referenced standards
1.5—Submittals
1.6—Delivery, storage, and handling
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3.12—Tolerances
3.13—Opening to traffic

Notes to specifier (nonmandatory)
General notes

Foreword to checklists
Checklist references

Mandatory Requirements Checklist

Optional Requirements Checklist
PART 1—GENERAL

1.1—Scope
   1.1.1 This Specification covers construction of pervious concrete pavement.
   1.1.2 This Specification is incorporated by Contract Documents and provides requirements for the Contractor.
   1.1.3 This Specification governs for construction within its scope, except project-specific Contract Documents govern if there is a conflict.
   1.1.4 This Specification governs if there is a conflict with referenced material and testing standards.
   1.1.5 Contractor is permitted to submit written alternatives to any provision in this Specification for consideration.
   1.1.6 Ignore provisions of this specification that are not applicable to the Work.
   1.1.7 Values in this Specification are stated in inch-pound units. A companion specification in SI units is available.
   1.1.8 The Notes to Specifier are not part of this Specification.

1.2 Interpretation
   1.2.1 Unless otherwise explicitly stated, this Specification shall be interpreted using the following principles.
      1.2.1.1 Interpret this Specification consistent with the plain meaning of the words and terms used.
      1.2.1.2 Definitions provided in this Specification govern over the definitions of the same or similar words or terms found elsewhere.
      1.2.1.3 Whenever possible, interpret this Specification so that its provisions are in harmony and do not conflict.
      1.2.1.4 Headings are part of this Specification and are intended to identify the scope of the provisions or sections that follow. If there is a difference in meaning or implication between the text of a provision and a heading, the meaning of the text governs.
      1.2.1.5 Where a provision of this Specification involves two or more items, conditions, requirements, or events connected by the conjunctions “and” or “or,” interpret the conjunction as follows: “and” indicate that all of the connected items, conditions, requirements, or events apply “or” indicates that the connected items, conditions, requirements, or events apply singularly.
      1.2.1.6 The use of the verbs “may” or “will” indicates that the Specification provision is for information to Contractor.
      1.2.1.7 The phrase “as indicated in Contract Documents” means the specifier included the provision requirements in Contract Documents.

This draft is not final and is subject to revision. This draft is for public review and comment.
1.2.1.8 The phrase “unless otherwise specified” means the specifier may have included an alternative to the default requirement in Contract Documents.

1.2.1.9 The phrase “if specified” means the specifier may have included a requirement in Contract Documents for which there is no default requirement in this Specification.

1.3—Definitions

The following definitions govern in this specification.

**accepted**—determined by Architect/Engineer to be in compliance with Contract Documents.

**Contract Documents**—set of documents that form the basis of a contractual relationship between an owner and contractor or design-builder. These documents are defined by the contractual agreement, and can contain contract forms, contract conditions, specifications, drawings, addenda, and contract changes.

**Contractor**—the person, firm, or entity under contract for construction of the Work.

**contraction joint**—sawed or tooled groove in a concrete pavement to create a weakened plane to regulate the location of cracking resulting from dimensional change of different parts of the structure pavement.

**design void content**—percentage of voids of a unit volume of pervious concrete based on the theoretical mixture proportions and design density, as tested in accordance with ASTM C1688/C1688M; Unit volume includes the volume of the solids and the voids.

**drawings**—graphic presentations that detail requirements for Work and may include written notes.

**hardened density**—the dry density of pervious concrete determined in accordance with ASTM C1754/C1754M

**extended set admixture**—An admixture that can predictably stop or reduce the hydration rate of cement for applications requiring extended time of setting followed by normal strength development; also referred to as a hydration controlling admixture or a hydration stabilizing admixture.

**lot**—5,000 ft² of pavement

**Owner**—the corporation, association, partnership, individual, public body, or authority for whom the Work is constructed.

**raveling**—the contiguous dislodging of surface aggregate.

**submit**—provide to Architect/Engineer for review.

**submittal**—document or material provided to Architect/Engineer for review and acceptance.

**testing agency**—the person, firm, or entity under contract for providing testing services.

**Work**—the entire construction or separately identifiable parts required to be furnished under Contract Documents.

1.4—Referenced standards

This draft is not final and is subject to revision. This draft is for public review and comment.
Standards of ACI, and ASTM cited in this Specification are listed by name and designation, including year.

### 1.4.1 American Concrete Institute

- 305.1-14—Specification for Hot Weather Concreting
- 330.1-14 Specification for Unreinforced concrete Parking Lots and Site Paving

### 1.4.3 ASTM International

- C29/C29M-17a—Standard Test Method for Bulk Density (Unit Weight) and Voids in Aggregate
- C33/C33M-18—Standard Specification for Concrete Aggregates
- C42/C42M-18a—Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
- C94/C94M-18—Standard Specification for Ready Mixed Concrete
- C150/C150M-18—Standard Specification for Portland Cement
- C171-16—Standard Specification for Sheet Materials for Curing Concrete
- C172/C172M-17—Standard Practice for Sampling Freshly Mixed Concrete
- C174/C174M-17—Standard Test Method for Measuring Thickness of Concrete Elements Using Drilled Concrete Cores
- C309-11—Standard Specification for Liquid-Membrane Forming Compounds for Curing Concrete
- C494/494M-17—Standard Specification for Chemical Admixtures for Concrete
- C595/595M-18—Standard Specification for Blended Hydraulic Cements
- C618-17a—Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
- C979/C979M-16—Standard Specification for Pigments for Integrally Colored Concrete
- C989/C989M-18—Standard Specification for Slag Cement for Use in Concrete and Mortars
- C1017/C1017M-13e1—Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete
- C1077-17—Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
- C1116/C1116M Standard Specification for Fiber-Reinforced Concrete
- C1157/1157M-17—Standard Performance Specification for Hydraulic Cement
- C1240-15—Standard Specification for Silica Fume Used in Cementitious Mixtures
- C1315-11—Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete

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C1688/C1688M-14a—Standard Test Method for Density and Void Content of Freshly Mixed Pervious Concrete
C1701/C1701M-17a – Standard Test Method for Infiltration Rate of In Place Pervious Concrete
C1754/C1754M-12— Standard Test Method for Density and Void Content of Hardened Pervious Concrete
C1761/C1761M-17 Standard Specification for Lightweight Aggregate for Internal Curing of Concrete
D994/D994M-11 (2016)—Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type)
D1751-18—Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types)
D1752-18—Standard Specification for Preformed Sponge Rubber, Cork, and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction
D3385-18—Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer
D3665-12(2017)—Standard Practice for Random Sampling of Construction Materials
E329-18—Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection

1.5—Submittals
1.5.1 Submit drawings and documentation required in 1.5.1.1 through 1.5.1.7. Obtain written acceptance of submittals from Architect/Engineer/Geotechnical Engineer before execution of related portion of Work.
1.5.1.1 Qualifications of Contractor or Consultant as specified in 1.7.1.1 and 1.7.1.2.
1.5.1.2 Proposed concrete mixture proportions with density and void content of freshly mixed pervious concrete determined in accordance with ASTM C1688/C1688M.
1.5.1.3 Reports documenting sources and quality of concrete-making materials.
1.5.1.4 Test panel properties as defined in 1.7.2.2.
1.5.1.5 If hot weather is anticipated during project, submit hot-weather concreting plan including procedures for production, transportation, placement, protection, curing, and temperature monitoring of concrete.
1.5.1.6 If cold weather is anticipated during project, submit cold-weather concreting plan including procedures for production, transportation, placement, protection, curing, and temperature monitoring of concrete.
1.5.1.7 Curing plan in accordance with 1.7.2.3.

1.7—Quality assurance and quality control
1.7.1 General—Test and inspect concrete materials and operations as Work progresses as specified in 1.7.3 and 1.7.4.
1.7.1.1 Contractor Qualifications—Unless otherwise specified, employ at least one National Ready Mixed Concrete Association (NRMCA) Certified Pervious Concrete Craftsman, or equivalent, who must shall be on site overseeing each placement crew during all concrete placement, or employ at least three NRMCA Certified Pervious Concrete Installers, or equivalent, who must shall be on site working as members of each placement crew during all concrete placement. The minimum number of certified individuals must be present on each pervious concrete placement, including test panel placements, and a certified individual must be in charge of the placement crew and procedures.

1.7.1.2—In lieu of employment, Contractor shall contract the services of a certified NRMCA Pervious Concrete Craftsman or equivalent consultant who meets requirements in 1.7.1.1. The consultant must be present on each pervious concrete placement, including test panel placements, and must be knowledgeable of the specific methods and procedures being used by Contractor performing Work.

1.7.2 Responsibilities of Contractor

1.7.2.1 Advise Owner’s testing agency at least 48 hours before each concrete placement and provide access to the worksite and facilities required for the testing.

1.7.2.2 Test panel construction—place test panel on the project site, jointed, and cured using the same means and methods to be used in the project. The test panel shall have an area of at least 225 ft² and be placed within tolerance of thickness specified in Contract Documents. Required information to be submitted from test panels shall be: density of fresh concrete determined in accordance with ASTM C1688/C1688M, infiltration rate determined in accordance with ASTM C1701/C1701M, and if cores are specified, the length of cores measured in accordance with ASTM C174/C174M, and density of cores determined in accordance with ASTM C1754/C1754M. The finished surface of test panels shall be evaluated for raveling by the Owner/Architect/Engineer at a time of not less than 7 days after placement of test panels.

1.7.2.3 Curing plan—Submit curing plan for pervious concrete pavement. Unless otherwise specified, this plan shall include all curing methods and minimum amount of time for curing of the concrete.

1.7.3 Responsibilities of testing agency

1.7.3.1 Testing agency will complete at least one density test on a sample of freshly mixed pervious concrete for each test panel. Testing agency will complete at least one density test on a sample of freshly mixed pervious concrete for each day of concrete placement or for each 50 yd³ of pervious concrete produced daily. If fresh density tests do not meet specification, frequency of testing will be increased at the discretion of Architect/Engineer to a frequency of up to each truckload until ready mixed producer demonstrates that concrete can be produced within specified tolerances. Testing for fresh density will be in accordance with ASTM C1688/C1688M. Sampling of freshly mixed concrete will be in accordance with ASTM C172/C172M.
1.7.3.2 If cores are specified, three full-depth cores will be removed from each lot and each test panel in accordance with ASTM C42/C42M, at least 7 days after placement of the pervious concrete.

1.7.3.2.a Three core locations shall be selected in accordance with ASTM D3665.

1.7.3.2.b Core lengths will be measured in accordance ASTM C174/C174M.

1.7.3.2.c After thickness determination, trim cores, and determine the hardened density of cores in accordance with ASTM C1754/C1754M Method B.

1.7.3.2.d Length and density of each individual core and average length and density of three cores shall be recorded.

1.7.3.2.e Fill core holes with conventional concrete or preblended coarse grout.

1.7.4 Acceptance of test panel

1.7.4.1 Fresh density of concrete used to make test panel shall be within ±5 lb/ft³ of the accepted fresh density for submitted mixture proportions.

1.7.4.2 Tolerances from specified pavement thickness are given in 1.7.4.2.a and 1.7.4.2.b.

1.7.4.2.a Average length of three cores: –3/8 in., +1.5 in.

1.7.4.2.b Length of an individual core: –3/4 in.

1.7.4.3 If test panel does not comply with 1.7.4.1 and 1.7.4.2, test panel shall be rejected, removed, and replaced at Contractor’s expense.

1.7.4.4 If test panel complies with 1.7.4.1 and 1.7.4.2 and is accepted, test panel shall be left in place until the Work is accepted and may be included in completed Work. If cores are specified, the average hardened density from the accepted test panel shall be the hardened density used as the basis of acceptance for remainder of pavement in accordance with 1.7.5.4.

1.7.5 Acceptance of pavement

1.7.5.1 Unless otherwise specified, the infiltration rate shall be at least 250 in./hr measured within 14 days of installation and in accordance with ASTM C1701/C1701M.

1.7.5.2 Fresh density determined in accordance with ASTM C1688/C1688M for each batch tested of the concrete used to make the test panel as determined from ASTM C1688/C1688M for each batch tested shall be within ±5 lb/ft³ of accepted fresh density for submitted mixture proportions in 1.5.1.2.

1.7.5.3 Tolerances from specified pavement thickness are given in 1.7.4.2a and 1.7.4.2.b.

1.7.5.3.a Average length of three cores: –3/8 in., +1.5 in.

1.7.5.3.b Length of an individual core: –3/4 in.

1.7.5.4 Average hardened density from each lot shall be within ±5 pcf of accepted hardened density established from test panel in 1.7.4.4.

1.7.6 When a tested batch lot is outside one or more of the limits of 1.7.5.1, 1.7.5.3, or 1.7.5.4.2, the lot shall be subject to rejection, removal, and replacement at Contractor’s expense, unless accepted.

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PART 2—PRODUCTS

2.1—Subbase

2.1.1 Aggregates—When an aggregate subbase is specified, material used shall be tested in accordance with ASTM C29 to determine requirements of Contract Documents.

2.2—Pervious concrete

Comply with ASTM C94/C94M, except sections: 4.2, 6.1.2, 6.1.3, 6.1.4, 6.1.5, 7, 8, 16, 17, 18, 19, and 20, and requirements listed in 2.2.1 through 2.2.7. Determine the volume of fresh concrete in a given batch by dividing the total batch weight by the density in accordance with ASTM C1688C1688M.

2.2.1 Thickness—Thickness of pervious concrete pavement shall be as specified in Contract Documents.

2.2.2 Aggregates—Aggregates shall meet quality requirements of ASTM C33/C33M. Aggregates shall meet size and voids designated in Contract Documents. Nominal maximum coarse aggregate size shall not exceed one-third of the specified pavement thickness, unless otherwise specified.

2.2.3 Cement—Cement shall comply with ASTM C150/C150M, ASTM C595/C595M, or ASTM C1157/C1157M.

2.2.4 Admixtures—Unless otherwise specified, chemical admixtures shall comply with ASTM C260/C260M, ASTM C494/C494M, or ASTM C1017/C1017M.

2.2.5 Fibers—If specified, use fibers that comply with ASTM C1116/C1116M.

2.2.6 Pigments—Pigments shall comply with ASTM C979/C979M.

2.2.7 Supplementary cementitious materials—Supplementary cementitious materials shall comply with ASTM C618, ASTM C989/C989M, or ASTM C1240.

2.2.8 Voids—Design void content of pervious concrete shall be as indicated in Contract Documents.

2.2.9 Internal Curing—Lightweight aggregate for internal curing shall comply with ASTM C1761/C1761M. Other materials for internal curing, including super-absorbent polymers are permitted when if accepted by Architect/Engineer. Super-absorbent polymers and other materials for internal curing shall be used in accordance with manufacturer’s recommendations. Add Kevern study reference here?

2.3—Isolation joint material

2.3.1 Isolation joint materials shall comply with ASTM D994/D994M, ASTM D1751, or ASTM D1752.

2.4—Forms

2.4.1 Unless otherwise specified, form-facing materials in contact with concrete shall be lumber, plywood, tempered concrete-form-grade hardboard, metal, plastic, or treated paper.

2.4.2 Use forms free of debris, non-adherent rust, and hardened concrete.

2.5—Curing Materials

2.5.1 Sheet materials for curing- Unless otherwise specified, use sheet materials that conform to ASTM C171.

PART 3—EXECUTION

This draft is not final and is subject to revision. This draft is for public review and comment.
3.1—Subgrade preparation
   3.1.1 Prepare subgrade as specified in Contract Documents.
   3.1.2 Construct subgrade to within $\pm 3/4$ in. of specified elevation.
   3.1.3 Provide physical barriers or direct traffic to minimize vehicular traffic on subgrade during construction. Regrade and re-compact subgrade disturbed by construction traffic, as needed.
   3.1.4 Determine subgrade infiltration rate in accordance with ASTM D3385 before subbase or pervious concrete placement. If subgrade infiltration rate is less than specified, proceed as indicated in Contract Documents.
   3.1.5 Install underdrains and geosynthetics if specified in contract documents.

3.2—Subbase
   3.2.1 Prepare subbase, if specified, in accordance with Contract Documents.
   3.2.2 Construct subbase to within $\pm 1/2$ in. of specified elevation.
   3.2.3 Provide physical barriers or use other provisions to direct traffic away from the construction site to minimize vehicular traffic on the subbase during construction. Regrade and re-compact subbase disturbed by construction traffic, as needed.

3.3—Setting formwork
   3.3.1 Set, align, and brace forms so that hardened pavement meets tolerances and grade slopes specified in Contract Documents.
   3.3.2 Protect previously placed pavement from damage. Do not apply form release agent to previously placed concrete.

3.4—Batching, mixing, and delivery
   3.4.1 Batch and mix in compliance with ASTM C94/C94M, except that discharge shall be completed within 60 minutes of introduction of mixture water or aggregate to the cement. Extended set-control admixture shall be used if discharge time is expected to exceed 60 minutes. The appropriate dosage rate shall be determined by ready mixed concrete producer to allow for the necessary fresh properties required for placement of concrete as determined by the Contractor. Additional water may be added on site as long as added water does not exceed the accepted design water-cementitious materials ratio.

3.5—Placing and finishing fixed-form pavement
   3.5.1 Wet subgrade or subbase with water before concrete placement such that material is saturated but no standing water shall be present at the time of concrete placement.
   3.5.2 Specify if alternative equipment is to be used to deposit concrete into the forms.
   3.5.3 Do not place concrete on frozen subgrade or subbase.
   3.5.4 Prepare surface to receive concrete in accordance with 3.5.1. Comply with 3.5.2 and 3.5.3.
   3.5.5 Spread concrete using mechanized equipment or hand tools, without causing segregation of mixture.
3.5.6 Strike-off and compact concrete between the forms using a form-riding paving machine, or roller screed. Other strike-off devices may be used if accepted.

3.6—Placing and finishing slipform pavement
3.6.1 Prepare surface concrete to receive concrete in accordance with 3.5.1. Comply with 3.5.2 and 3.5.3.

3.7—Edging
3.7.1 Edge top surface to a radius of at least 1.5 times maximum nominal aggregate size.

3.8—Final surface texture
3.8.1 Final surface texture shall match that of appearance of test panel.

3.9—Jointing
3.9.1 Construct joints at locations, depths, and with tolerances given in horizontal dimensions indicated in Contract Documents.
3.9.2 Create contraction joints by one of the methods listed in 3.9.2.1 or 3.9.2.2.
3.9.2.1 Sawcut concrete after concrete has hardened sufficiently to prevent aggregate from being dislodged and before pavement cracks. Immediately flush or vacuum the area adjacent to the joint to remove the dust or slurry created by sawing. If plastic sheeting is removed to sawcut joints, minimize loss of moisture by removing only the area being sawcut, then moisten the uncovered area and replace plastic sheeting.
3.9.2.2 Tool contraction joints to specified depth and width in fresh concrete immediately after striking off.

3.10—Curing
3.10.1 Unless otherwise specified, begin curing within 10 minutes of concrete discharge, unless other accepted steps are taken to extend placement and finishing time.
3.10.2 Clearly identify new concrete and protect using warning tape or other barricades to clearly identify and prevent damage during curing period and cure concrete in accordance with 3.10.2.1.
3.10.2.1 Cover the pavement surface and all exposed edges with polyethylene sheeting. Thoroughly secure polyethylene sheet at all exterior edges and interior laps without using soil. The method of securing cover material shall prevent wind from removing the sheet and from blowing under the sheet across surface of the concrete.
3.10.3 Unless otherwise specified, cure pavement for at least 7 days.

3.11—Hot or cold-weather construction
3.11.1 Hot weather concreting shall be in accordance with ACI 305.1 including supplementary requirements indicated in Contract Documents. and shall be in accordance with ACI 305.1 including supplementary requirements indicated in the Contract Documents.
3.11.2 Cold weather concreting shall be in accordance with ACI 306.1, including supplementary requirements indicated in Contract Documents.

3.12 — Tolerances

3.12.1 Construct pavement to comply with the following tolerances:

- Elevation: ±3/4 in.
- Thickness: + 1 ½ in., - 3/8 in.
- Contraction joint depth: 1/4 thickness of pavement ±1/4 in.
- Smoothness: Similar to approved test panel with no abrupt offsets unless required by drawings.

3.12.2 Mechanically sweep or vacuum pavement with clean water, before testing for compliance with tolerances.

3.13 — Opening to traffic

3.13.1 If the ambient temperature has been maintained at least 55 °F during the continuous curing period:

3.13.1.1 Foot traffic is permitted after at least 24 hours

3.13.1.2 Car and light truck vehicular traffic permitted after at least 7 days of curing

3.13.1.3 Truck traffic allowed 10 days after placement

3.13.2 Longer curing times are needed if air temperatures are lower than 55 °F or if supplementary cementitious materials are used at a replacement rate greater than percent of Portland cement.

NOTES TO SPECIFIER (nonmandatory)

General Notes

G1. ACI Specification 522.1 is to be used by reference in the Project Specification. Do not copy individual sections, parts, articles, or paragraphs into the Project Specification because taking them out of context may change their meaning.

G2. If sections or parts of ACI Specification 522.1 are copied into the Project Specification or any other document, do not refer to them as an ACI specification.

G3. A statement such as the following shall serve to make ACI Specification 522.1 a part of the Project Specification:

“Work on (Project Title) shall conform to all requirements of ACI 522.1 “Specifications for Pervious Concrete,” published by the American Concrete Institute, Farmington Hills, Michigan, except as modified by these Contract Documents.”

G4. ACI Specification 522.1 is written in the three-part section format of the Construction Specifications Institute, as adapted for ACI requirements.
G5. If ACI Specification 522.1 is referenced in Contract Documents along with another ACI specification that contains overlapping provisions, identify which requirements are in conflict and state in Contract Documents which requirements govern.

FOREWORD TO CHECKLISTS

F1. This foreword is included for explanatory purposes only; it is not a part of ACI Specification 522.1.
F2. ACI Specification 522.1 may be referenced by the specifier in the Project Specification for any building project, together with supplementary requirements for the specific project. Responsibilities for project participants must be defined in the Project Specification. ACI Specification 522.1 cannot and does not address responsibilities for any project participant other than Contractor.
F4. The Mandatory Requirements Checklist indicates work requirements regarding specific qualities, procedures, materials, and performance criteria that are not defined in ACI Specification 522.1. The specifier must include these requirements in the Project Specification.
F5. The Optional Requirements Checklist identifies specifier alternatives or additions. The checklist identifies the sections, parts, and articles of ACI Specification 522.1, and the action required or available to the specifier. The specifier should review each of the items in the checklist and make adjustments to the needs of a particular project by including those selected alternatives or additions as mandatory requirements in the Project Specification.
F6. Cited references—Documents and publications that are referenced in the checklists of ACI Specification 522.1 are listed below. These references provide guidance to the specifier and are not considered to be part of ACI Specification 522.1.

American Concrete Institute
305.1-14—Specification for Hot Weather Concreting

ASTM International
C33/C33M-18—Standard Specification for Concrete Aggregates
C174/C174M-17—Standard Test Method for Measuring Thickness of Concrete Elements Using Drilled Concrete Cores
**MANDATORY REQUIREMENTS CHECKLIST**

<table>
<thead>
<tr>
<th>Section/Part/Article</th>
<th>Notes to Specifier</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.7.2.2, 2.2.1</td>
<td>Specify thickness of the pervious concrete pavement.</td>
</tr>
<tr>
<td>2.1.12</td>
<td>Specify the grading requirements.</td>
</tr>
<tr>
<td>2.2.2</td>
<td>Specify the class designation for aggregates. Specify the grading requirements.</td>
</tr>
<tr>
<td>2.2.8</td>
<td>Specify design void content. Typical range for pavement applications is between 15% and 25% as determined using ASTM C1688/C1688M.</td>
</tr>
<tr>
<td>3.1.1</td>
<td>Specify subgrade preparation including percent maximum dry density determined in accordance with current versions of ASTM D698 using Method C</td>
</tr>
<tr>
<td>3.1.2</td>
<td>Specify subgrade elevations.</td>
</tr>
<tr>
<td>3.1.4</td>
<td>Specify protocol indicating how to proceed if subgrade infiltration rate is less than specified. If subgrade conditions differ from information contained in the project documents the Contractor shall immediately notify the Engineer/Architect and stop subgrade preparation work until a written</td>
</tr>
</tbody>
</table>
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notice of remedial action to be taken and a notice to proceed is received.

3.2.1 Specify subbase preparation requirements including percent maximum dry density using current version of ASTM D698.

3.2.2 Specify subbase surface elevations.

3.5.7 Specify final surface elevations.

3.9.1 Specify joint types, locations, depths, and widths. The following provides general guidance for specifying jointing.

Specify locations of contraction joints, construction joints, and isolation joints. The maximum spacing between contraction joints is provided in the following table based on thickness of pavement:

**Maximum spacing between joints**

<table>
<thead>
<tr>
<th>Pavement thickness, in.</th>
<th>Maximum spacing, ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>4, 4-1/2</td>
<td>10</td>
</tr>
<tr>
<td>5, 5-1/2</td>
<td>12-1/2</td>
</tr>
<tr>
<td>6 or greater</td>
<td>15</td>
</tr>
</tbody>
</table>

The larger dimension of a panel should not exceed 125 percent of the smaller dimension.

The minimum angle between two intersecting joints should be 80 degrees.

Joints should intersect pavement-free edges at 90-degree angles and extend straight for
at least 1-1/2 ft from the pavement edge, where possible.

Align joints of adjacent panels.

The minimum contraction joint depth, using a conventional saw, hand tools, or inserts, should be 1/4 of the pavement thickness.

Use isolation joints where pavement abuts buildings, foundations, existing pavements, manholes, and other fixed objects.

3.11.1

Review the mandatory and optional requirements checklists in the Notes to Specifier of ACI 305.1 and provide the necessary requirements in the Contract Documents.

3.13.2

Longer curing times are needed if air temperatures are lower than 55 °F or if supplementary cementitious materials are used at a replacement rate greater than percent of Portland cement.

**OPTIONAL REQUIREMENTS CHECKLIST**

<table>
<thead>
<tr>
<th>Section/Part/Article</th>
<th>Notes to Specifier</th>
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</thead>
<tbody>
<tr>
<td>1.5.1.5</td>
<td>Alternative jointing plan and placing sequence to those provided in Contract Documents.</td>
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<tr>
<td>1.7.1.1</td>
<td>Specify alternative qualifications of the pervious concrete pavement contractor.</td>
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<tr>
<td>1.7.2.2, 1.7.3.2</td>
<td>Specify if coring of pervious concrete is required to determine thickness (ASTM C174/C174M) and density (ASTM C1754/C1754M) of the in-place pervious concrete pavement. Typically used only for heavy use pavements.</td>
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<tr>
<td>1.7.2.3</td>
<td>Specify alternative requirements for what is to be included in the curing plan.&quot; The default is to include curing method and curing time.</td>
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<tr>
<td>1.7.5.1</td>
<td>Specify alternative minimum value of infiltration rate.</td>
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<tr>
<td>2.1.2</td>
<td>Specify a subbase if needed to support traffic loading and/or to serve as a reservoir to store stormwater.</td>
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<tr>
<td>2.2.2</td>
<td>Specify alternative value for nominal maximum size of coarse aggregate.</td>
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<tr>
<td>2.2.4</td>
<td>Specify requirements for admixtures if other than ASTM C260/C260M, ASTM C494/C494M, or ASTM C1017/C1017M.</td>
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<tr>
<td>2.2.5</td>
<td>If required, specify the type and dosage of fibers.</td>
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<tr>
<td>2.4.1</td>
<td>Specify alternative requirements for form-facing material.</td>
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<tr>
<td>2.5.1</td>
<td>If surface appearance is of concern, specify alternative curing materials that will not stain or discolor concrete.</td>
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<tr>
<td>3.5.2</td>
<td>Specify if alternative equipment is to be used to deposit pervious concrete into forms.</td>
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<tr>
<td>3.10.1</td>
<td>Specify when to begin curing if not within 10 minutes of concrete discharge.</td>
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<tr>
<td>3.10.3</td>
<td>Specify the minimum time of curing if other than at least 7 continuous days.</td>
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</tbody>
</table>

If air temperature is lower than 55 °F and supplementary cementitious materials are used at a replacement rate greater than 20 percent of cement, curing time may be extended as recommended by the Engineer or producer.