# 3 Materials

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.0</td>
<td>Introduction</td>
<td>104</td>
</tr>
<tr>
<td>3.1</td>
<td>Roadways</td>
<td>107</td>
</tr>
<tr>
<td>3.1.1</td>
<td>Asphaltic Concrete</td>
<td>108</td>
</tr>
<tr>
<td>a</td>
<td>Imprinted Asphalt</td>
<td>109</td>
</tr>
<tr>
<td>b</td>
<td>High Albedo Asphalt</td>
<td>110</td>
</tr>
<tr>
<td>c</td>
<td>Porous Asphalt</td>
<td>111</td>
</tr>
<tr>
<td>3.1.2</td>
<td>Concrete</td>
<td>112</td>
</tr>
<tr>
<td>3.1.3</td>
<td>Granite Block</td>
<td>113</td>
</tr>
<tr>
<td>a</td>
<td>Modular Cobblestones</td>
<td>114</td>
</tr>
<tr>
<td>3.1.4</td>
<td>Interlocking Permeable Concrete or Asphalt Pavers</td>
<td>115</td>
</tr>
<tr>
<td>3.2</td>
<td>Crosswalks</td>
<td>116</td>
</tr>
<tr>
<td>3.2.1</td>
<td>Granite Pavers</td>
<td>117</td>
</tr>
<tr>
<td>3.2.2</td>
<td>Thermoplastic Imprinting</td>
<td>118</td>
</tr>
<tr>
<td>3.3</td>
<td>Sidewalks</td>
<td>119</td>
</tr>
<tr>
<td>3.3.1</td>
<td>Untinted Concrete</td>
<td>120</td>
</tr>
<tr>
<td>a</td>
<td>Tinted Concrete</td>
<td>121</td>
</tr>
<tr>
<td>b</td>
<td>Tinted Concrete with Exposed Light–Colored Aggregate</td>
<td>122</td>
</tr>
<tr>
<td>c</td>
<td>Tinted Concrete with Silicon Carbide Treatment</td>
<td>123</td>
</tr>
<tr>
<td>d</td>
<td>Sand–Colored Concrete with Exposed Aggregate</td>
<td>124</td>
</tr>
<tr>
<td>e</td>
<td>Porous Concrete</td>
<td>125</td>
</tr>
<tr>
<td>f</td>
<td>London Pavers</td>
<td>126</td>
</tr>
<tr>
<td>3.3.2</td>
<td>Mastic Asphalt</td>
<td>127</td>
</tr>
<tr>
<td>3.3.3</td>
<td>Hexagonal Asphalt Pavers</td>
<td>128</td>
</tr>
<tr>
<td>3.3.4</td>
<td>Bluestone Flags</td>
<td>129</td>
</tr>
<tr>
<td>3.3.5</td>
<td>Granite Slabs</td>
<td>130</td>
</tr>
<tr>
<td>3.3.6</td>
<td>Rubber Pavers</td>
<td>131</td>
</tr>
<tr>
<td>3.4</td>
<td>Sidewalk Furnishing Zones</td>
<td>132</td>
</tr>
<tr>
<td>3.4.1</td>
<td>Granite Block</td>
<td>133</td>
</tr>
<tr>
<td>b</td>
<td>Concrete Cobbles</td>
<td>134</td>
</tr>
<tr>
<td>c</td>
<td>Modular Cobblestones</td>
<td>135</td>
</tr>
<tr>
<td>3.4.2</td>
<td>Square Asphalt or Concrete Pavers</td>
<td>136</td>
</tr>
<tr>
<td>3.4.3</td>
<td>Concrete with Exposed Glass Aggregate</td>
<td>137</td>
</tr>
<tr>
<td>3.5</td>
<td>Curbs</td>
<td>138</td>
</tr>
<tr>
<td>3.5.1</td>
<td>Untinted Concrete</td>
<td>139</td>
</tr>
<tr>
<td>a</td>
<td>Tinted Concrete</td>
<td>140</td>
</tr>
<tr>
<td>b</td>
<td>Integral Concrete Curb and Gutter</td>
<td>141</td>
</tr>
<tr>
<td>3.5.2</td>
<td>Granite</td>
<td>142</td>
</tr>
<tr>
<td>3.6</td>
<td>Plazas</td>
<td>143</td>
</tr>
<tr>
<td>3.6.1</td>
<td>Imprinted Asphalt</td>
<td>144</td>
</tr>
<tr>
<td>3.6.2</td>
<td>Hexagonal Concrete Pavers</td>
<td>145</td>
</tr>
<tr>
<td>3.6.3</td>
<td>Decorative Gravel</td>
<td>146</td>
</tr>
<tr>
<td>a</td>
<td>Resin–Bound Gravel</td>
<td>147</td>
</tr>
</tbody>
</table>
### Materials Reference Guide

<table>
<thead>
<tr>
<th>Section</th>
<th>Material</th>
<th>Standard</th>
<th>Optional</th>
<th>Historic</th>
<th>Pilot</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3.1</strong> Roadway</td>
<td>Asphaltic Concrete</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1.1</td>
<td>Imprinted Asphalt</td>
<td></td>
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</tr>
<tr>
<td>3.1.1a</td>
<td>High Albedo Asphalt</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>3.1.1c</td>
<td>Porous Asphalt</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1.2</td>
<td>Concrete</td>
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<tr>
<td>3.1.3</td>
<td>Granite Block</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>3.1.3b</td>
<td>Modular Cobblestones</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1.4</td>
<td>Permeable Asphalt or Concrete Pavers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>3.2</strong> Crosswalk</td>
<td>Same as Roadway</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.2.1</td>
<td>Granite Pavers</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3.2.2</td>
<td>Thermoplastic Imprinting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>3.3</strong> Sidewalks</td>
<td>Same as Sidewalk</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3.1</td>
<td>Untinted Concrete</td>
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<tr>
<td>3.3.1a</td>
<td>Tinted Concrete</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3.1b</td>
<td>Tinted Concrete with Exposed Light-Colored Aggregate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3.1c</td>
<td>Tinted Concrete with Silicon Carbide Treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3.1d</td>
<td>Sand-Colored Concrete with Exposed Aggregate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3.1e</td>
<td>Porous Concrete</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3.1f</td>
<td>London Pavers</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3.3.2</td>
<td>Mastic Asphalt</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3.3</td>
<td>Hexagonal Asphalt Pavers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3.4</td>
<td>Bluestone Flags</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3.5</td>
<td>Granite Slabs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3.6</td>
<td>Rubber Pavers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>3.4</strong> Sidewalk Furnishing Zones</td>
<td>Same as Sidewalk</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.4.1</td>
<td>Untinted Concrete</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.4.1a</td>
<td>Tinted Concrete</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.4.1b</td>
<td>Tinted Concrete with Exposed Light-Colored Aggregate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.4.1c</td>
<td>Tinted Concrete with Silicon Carbide Treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Section</td>
<td>Material</td>
<td>Standard</td>
<td>Optional</td>
<td>Historic</td>
<td>Pilot</td>
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</tr>
<tr>
<td>3.3.1d</td>
<td>Sand–Colored Concrete with Exposed Aggregate</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3.1e</td>
<td>Porous Concrete</td>
<td></td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>3.3.1f</td>
<td>London Pavers</td>
<td></td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>3.3.2</td>
<td>Mastic Asphalt</td>
<td></td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>3.3.3</td>
<td>Hexagonal Asphalt Pavers</td>
<td></td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>3.3.4</td>
<td>Bluestone Flags</td>
<td></td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>3.3.5</td>
<td>Granite Slabs</td>
<td></td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>3.3.6</td>
<td>Rubber Pavers</td>
<td></td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>3.4.1a</td>
<td>Concrete Cobbles</td>
<td></td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>3.4.1b</td>
<td>Modular Cobblestones</td>
<td></td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>3.4.2</td>
<td>Square Asphalt Pavers</td>
<td></td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>3.4.3</td>
<td>Concrete with Exposed Glass Aggregate</td>
<td></td>
<td></td>
<td></td>
<td>●</td>
</tr>
</tbody>
</table>

### Curbs

<table>
<thead>
<tr>
<th>Section</th>
<th>Material</th>
<th>Standard</th>
<th>Optional</th>
<th>Historic</th>
<th>Pilot</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5.1</td>
<td>Concrete</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.5.1a</td>
<td>Tinted Concrete</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.5.1b</td>
<td>Granite</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.5.2</td>
<td>Integral Concrete Curb and Gutter</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Plazas

*Same as Sidewalk Furnishing Zones*

<table>
<thead>
<tr>
<th>Section</th>
<th>Material</th>
<th>Standard</th>
<th>Optional</th>
<th>Historic</th>
<th>Pilot</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.3.1</td>
<td>Untinted Concrete</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3.1a</td>
<td>Tinted Concrete</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3.1b</td>
<td>Tinted Concrete with Exposed Light–Colored Aggregate</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3.1c</td>
<td>Tinted Concrete with Silicon Carbide Treatment</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3.1d</td>
<td>Sand–Colored Concrete with Exposed Aggregate</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3.1e</td>
<td>Porous Concrete</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3.1f</td>
<td>London Pavers</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3.2</td>
<td>Mastic Asphalt</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3.3</td>
<td>Hexagonal Asphalt Pavers</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3.4</td>
<td>Bluestone Flags</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3.5</td>
<td>Granite Slabs</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3.6</td>
<td>Rubber Pavers</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.4.1a</td>
<td>Concrete Cobbles</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.4.1b</td>
<td>Modular Cobblestones</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.4.2</td>
<td>Square Asphalt Pavers</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.4.3</td>
<td>Concrete with Exposed Glass Aggregate</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.6.1</td>
<td>Imprinted Asphalt</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.6.2</td>
<td>Hexagonal Concrete Pavers</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.6.3</td>
<td>Decorative Gravel</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.6.3a</td>
<td>Resin–Bound Gravel</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Introduction

About this Chapter
This chapter identifies attractive and practical materials for use at recommended locations.

Usage Categories
The materials have been divided into four categories: wide use or “standard” application, limited use or “optional” application, “historic” landmark application, and “pilot” application.

Projects utilizing the standard materials in the identified contexts will generally only require a permit from NYC DOT. Optional materials will receive expedited review but will generally require a maintenance agreement. Paving materials not included in this manual may be proposed but are discouraged and will require full design and engineering review from the Design Commission and NYC DOT and will require a maintenance agreement.

Standard
Material is required in specified context(s) unless a distinctive treatment is approved by NYC DOT and the Design Commission.

Optional
Material is permitted for use in specified context(s), pending city review. Optional materials require approval from the Design Commission before being installed.

Historic
Material is subject to the requirements of the New York City Landmarks Preservation Commission.

Pilot Usage
Materials with sustainable properties that will be tested prior to classification in future editions of this manual either as standard or optional.

New Sidewalk Standards for Commercial Districts
Pending regulatory change, sidewalks abutting properties in certain commercial districts shall be constructed of Tinted Concrete (3.3.1a). The affected sidewalks will be in commercial districts C4–4 through C4–7, C5 and C6, as defined in the Zoning Resolution of the City of New York (see map on opposite page). As such, any sidewalk installation or replacement constituting 50% or more of the total square footage of the sidewalk abutting a property located in the aforementioned commercial districts will be required to use the new sidewalk standard.

Specification Sources
The recommendations in this chapter supplement rather than replace existing engineering standards. Readers are directed to the sources noted below, those listed in Appendix C, and any applicable resources.

Detailed information on the specifications for standard materials is contained in the NYC DOT/DDC Standard Highway Specifications. Typical construction details are provided in the NYC DOT Standard Details of Construction. Information regarding standard procedures and approval requirements is provided in the Instructions for Filing Plans and Guidelines for the Design of Sidewalks, Curbs, Roadways and Other Infrastructure Components.

The design guidance described here does not supersede any existing federal, state or local laws, rules, and regulations. All projects remain subject to relevant statutes, such as the Zoning Resolution of the City of New York, City Environmental Quality Review (CEQR) and appropriate reviews and approvals of oversight agencies.
Map of Commercial Districts with New Sidewalk Standard
(Credit: NYC Department of City Planning)
Applicability and Exceptions
All new projects that significantly impact public and private streets should follow these guidelines. NYC DOT approval will be based on site specific conditions and cost–effective engineering standards and judgment, with the safety of all street users being of paramount importance.

Sidewalk Reviews and Approvals
Installation of sidewalk associated with new building construction is coordinated by the Department of Buildings through the Builder’s Pavement Plan. For other installations of new sidewalk, property owners or constructing entities must file a Sidewalk, Curb & Roadway Application (SCARA) with NYC DOT. All treatments in “optional” or “pilot” usage categories also require the filing of a Distinctive Sidewalk Application and receiving of approval from the Design Commission before being installed. For more information on sidewalk permits, reviews, and approvals, download the Instructions for Filing Plans and Guidelines for the Design of Sidewalks, Curb, Roadways and Other Infrastructure Components at nyc.gov/streetdesignmanual. For further information, please visit the Design Commission’s website at nyc.gov or call 311.

Maintenance Agreements
Each treatment in this chapter has a statement indicating whether or not the material requires a maintenance agreement before being installed. This agreement requires that the adjacent property owner, installing entity, or some other entity will generally be responsible for maintaining that material and providing appropriate insurance. For sidewalks and curbing, the constructing entity must file a Distinctive Sidewalk Improvement Maintenance Agreement with the NYC DOT Bureau of Permit Management & Construction Control. For other materials requiring maintenance agreements—such as roadbeds, furnishing zones and plazas—proposals should first be reviewed with the appropriate NYC DOT Borough Commissioner. Contact information for NYC DOT Borough Commissioners can be found at nyc.gov/dot or by calling 311.
Roadways

Roadways represent the paved central portion of the street that allow access to and movement through an area (see Glossary). Most roadways are designed for vehicular use.
Asphaltic Concrete

**Usage: Standard**

Mixture of asphalt binder and stone aggregate, usually laid on a concrete base and compacted by a roller to form a solid road surface.

**Benefits**
- Provides smooth, durable, and frictionally excellent road surface
- Material is widely available and cost effective
- Impervious quality channels water to the curb on crowned roadways
- Dark color hides dirt and stains, creates background for high-contrast markings
- Easy to maintain and patch
- Can be pigmented or imprinted for varied purposes
- Asphalt can be recycled

**Considerations**
- Prone to rutting and shoving under high volumes of heavy vehicles

**Application**
- Asphalt is standard for roadbeds in all neighborhoods unless otherwise specified

**Design**
- Minimum 3-inch-thick wearing course, typically
- Roadway should be crowned to drain stormwater from the road surface
- May require concrete base

**Specification source:** NYC DOT Standard Specifications sections 2.05, 3.01, 4.01, 4.02

**Detail source:** NYC DOT Standard Details drawing H–1034 and related

**Sustainability Opportunities**
- High recycled asphalt (RAP) content
- Asphalt with high SRI values
- Porous asphalt

**Material is preferred road surface for cyclists**

**This material is generally maintained by NYC DOT**
Imprinted Asphalt

**USAGE: OPTIONAL**

Machine–heated asphalt, imprinted with a pattern template and colored with protective coating.

**Benefits**
- Visually defines pedestrian or non–vehicle areas
- Can be installed on existing asphalt that is in good condition
- Preserves asphalt roadway for vehicle use if necessary
- More cost–effective than unit pavers
- Easier to maintain than unit pavers

**Considerations**
- Pattern and colored coating may deteriorate if exposed to regular vehicle traffic
- Use of this material generally requires a maintenance agreement

**Application**
- Appropriate for roadways or parts of roadways with no regular vehicular traffic, such as restricted–use streets, pedestrian streets, or plazas
- Can be used for areas of the roadbed that are not intended for regular vehicle travel, such as textured aprons or medians

**Design**
- See design guidance for ASPHALTIC CONCRETE
- Can be installed on existing asphalt that is in good condition
- Various patterns and colors available
- Specification source: NYC DOT Standard Specifications section 6.45B

**Sustainability Opportunities**
- See sustainability opportunities for ASPHALTIC CONCRETE
- High SRI value coloring
High Albedo Asphalt

By reflecting sunlight, lighter–colored paving reduces the urban heat island effect.

**Highway showing left side paved with high–albedo asphalt and the right side paved with conventional asphalt: Interstate 10, West Texas (Credit: The Citizen Scientist, April 16, 2004)**

**Benefits**

See benefits of ASPHALTIC CONCRETE (3.1.1)

Reflects more of the sun's rays and absorbs less heat than traditional black asphalt pavement, mitigating the urban heat island effect.

**Considerations**

See considerations for ASPHALTIC CONCRETE

Light–colored natural aggregates are considerably more expensive than dark because of limited local availability.

**Application**

Streets with high sun exposure, ideally in an urban setting sheltered from wind, where impacts on surrounding air quality can be effectively measured.

Should be piloted on streets with low vehicle traffic.

Should not be piloted where frequent utility cuts are likely.

**Use of this material generally requires a maintenance agreement**

**Design**

See design guidance for ASPHALTIC CONCRETE

Aggregate: light in color

Asphaltic cement: white or light–colored binder if available

Other options: white chippings in hot–rolled asphalt

**Sustainability Opportunities**

See sustainability opportunities for ASPHALTIC CONCRETE
Porous Asphalt

**Usage: Pilot**

Standard asphaltic concrete mixed without fine particles and with low binder content, leaving space for water to drain through to an open–graded stone bed.

**Benefits**

- See benefits of ASPHALTIC CONCRETE (3.1.1)
- Exhibits similar structural properties as conventional asphalt
- Allows stormwater to drain through, reducing runoff into the sewer system
- Reduces likelihood of ponding and slick or icy road conditions
- May be less prone to cracking in winter than conventional pavement

**Considerations**

- See considerations for ASPHALTIC CONCRETE
- Not appropriate for use where there is water–sensitive subsurface infrastructure
- Not effective at greater than 5% slope
- Only certain soil types are appropriate as subbases for infiltration
- Porosity can convey harmful chemicals into the soil
- May require routine vacuuming of surface to maintain porosity

**Application**

- On a level street above the high water table with low vehicle traffic

**Design**

- See design guidance for ASPHALTIC CONCRETE
- Aggregate should be no smaller than 600 µm, or the No. 30 sieve
- Asphaltic cement should be 5.75–6.0% bituminous asphalt content by weight
- Requires 18– to 36–inch stone infiltration bed with detention system and/or overflow controls and even distribution of stormwater
- Bottom of infiltration bed should be at least 3 feet above high water table and 2 feet above bedrock

**Sustainability Opportunities**

- See sustainability opportunities for ASPHALTIC CONCRETE
Concrete

**USAGE: STANDARD**

Mixture comprised of cement(s), aggregate(s), water, and other chemical admixtures, poured over metal reinforcement bars, smoothed, and then allowed to harden, forming a solid road surface.

**Benefits**

- Provides durable and frictionally excellent road surface
- This material is widely available and cost effective
- Impervious quality channels water to the curb on crowned roadways
- Resists rutting and shoving that can occur with asphalt
- Compared to asphalt, reduces impact of vehicle travel vibrations on sub-surface features and neighboring structures

**Considerations**

- Difficult to replace or patch in sections where utility cuts or defects occur

**Application**

- Should be used wherever engineering criteria dictates, such as bridges, vaulted roadways, or bus pads
- Should not be used where frequent utility cuts are likely
- Will be evaluated on a case-by-case basis based on engineer review of roadway structure

**This material is generally maintained by NYC DOT**

**Design**

- Must have joints to allow for expansion no more than 20 feet apart
- May require metal reinforcement bars as specified by NYC DOT

**Specification source:** NYC DOT Standard Specifications sections 3.05, 4.05

**Detail source:** NYC DOT Standard Details drawing H–1050

**Detail source (bus pad):** NYC DOT Standard Details drawings H–1005, H–1005 A

**Sustainability Opportunities**

- Supplementary cementitious materials (SCM)
Granite Block

**Usage: Optional/Historic**

Historic smooth–finish granite block unit pavers often referred to as “cobblestones,” commonly used throughout New York City in the 19th Century.

**Benefits**
- Reinforces historic character
- Calms vehicle traffic
- Visually delineates separation of street uses or modal priorities
- Cobblestones are relatively easy to remove and reset, especially for utility access

**Considerations**
- Stones can become loose over time and will require regular maintenance
- May generate significant noise from vehicle tires
- Uneven surface can hinder pedestrian, cyclist, and disabled persons’ mobility
- Provision should be made for a smooth cycling surface if it’s part of a planned bike route
- Can be slippery when wet

**Application**
- Should be used wherever there is existing cobblestone in areas where the historic fabric remains intact
- May be used to provide visual delineation to separate bike lanes from vehicle lanes or vehicle lanes from pedestrian areas (see 3.4.1)
- Can be used to designate areas of the roadbed not intended for regular vehicle travel, such as pedestrian streets or textured gutters, aprons, or medians

**Design**
- Can be sand–set for easier installation and greater permeability, or mortar–set for stronger structural properties
- May require concrete base
- Specification source: NYC DOT
- Standard Specifications sections 2.06, 6.04

**Sustainability Opportunities**
- Salvaged cobbles
- Permeable installation

**Typical cobblestone roadway: Jay Street at Hudson Street, Manhattan**
Modular Cobblestone

**USAGE: OPTIONAL**

A pre-assembled grid of smooth saw-cut finish granite cobbles fastened to a sturdy backing and installed as modular tiles.

**Benefits**
- See benefits of GRANITE PAVERS (3.1.3)
- Easier to install and maintain than traditional cobblestone
- Smooth, saw-finish stones do not hinder pedestrian or cyclist mobility

**Considerations**
- See considerations for GRANITE PAVERS
- Exact lifecycle of product is unknown

**Application**
- Roadways with no regular vehicular traffic such as restricted-use streets, pedestrian streets, or plazas
- Can be used for areas of the roadbed that are not intended for regular vehicle travel, such as textured aprons or medians
- Should not be used where frequent utility cuts are likely

**Use of this material generally requires a maintenance agreement**

**Design**
- Requires concrete base
- Various colors and styles available

**Specification source:** NYC DOT

Standard Specifications section 6.06MC
### Interlocking Permeable Concrete or Asphalt Pavers

**Usage:** PILOT

Interlocking unit pavers with voids between them to allow rainwater to pass through.

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Similar structural properties to conventional unit pavers</td>
<td>On a level street above the high water table with low vehicle traffic and few heavy vehicles</td>
</tr>
<tr>
<td>Allows stormwater to drain through, reducing runoff into the sewer system</td>
<td>Must have adequate subsurface conditions to detain stormwater</td>
</tr>
<tr>
<td>Reduces likelihood of ponding and slick or icy road conditions</td>
<td>Can be used to pave an entire roadway or just the parking lane or gutter strip</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Considerations</th>
<th>Use of this material generally requires a maintenance agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not appropriate for use where there is water-sensitive subsurface infrastructure</td>
<td></td>
</tr>
<tr>
<td>Not effective at greater than 5% slope</td>
<td>Avoid where there is potential for soil contamination</td>
</tr>
<tr>
<td>Only certain soil types are appropriate as subbases for infiltration</td>
<td></td>
</tr>
<tr>
<td>Permeability can convey harmful chemicals into the soil</td>
<td></td>
</tr>
<tr>
<td>Unit pavers can become loose over time and will require regular maintenance</td>
<td>Use of this material generally requires a maintenance agreement</td>
</tr>
<tr>
<td>Vegetative growth in voids will occur</td>
<td></td>
</tr>
<tr>
<td>May require routine vacuuming of surface to maintain permeability</td>
<td></td>
</tr>
</tbody>
</table>

**Design**

- Hard joint sand should be used where vehicles will drive over the pavers
- Requires 18– to 36–inch stone infiltration bed with detention system and/or overflow controls, and even distribution of stormwater
- Bottom of infiltration bed should be at least 3 feet above high water table and 2 feet above bedrock

**Sustainability Opportunities**

- Supplementary cementitious materials (SCM)
- High recycled asphalt (RAP) content
Crosswalks

Crosswalks are delineated areas of the roadbed that indicate where pedestrians are expected to cross and alert drivers to that possibility (see Glossary). In certain instances, crosswalks may have patterns or be constructed from materials that further increase their visibility or add character to a neighborhood. This section is intended to include only surface materials approved for creating distinctive crosswalks. It does not include guidance on using standard thermoplastic markings to designate crosswalks for traffic control purposes. For this information, please refer to the Federal Manual on Uniform Traffic Control Devices.

In addition to the materials listed in this section, all materials listed in the Roadways section may be used in crosswalks as well, according to the application guidance provided.
Granite Pavers

**USAGE: OPTIONAL**

Stone unit paver known for durability and associated with high-quality traditional streets.

**Benefits**
Visually enhances crosswalk

**Considerations**
Due to the possibility of pavers cracking or becoming uneven, and asphalt shoving at the borders, application requires attentive maintenance

**Application**
Crosswalks on historic streets or where distinction is desired and there are low volumes of heavy vehicle traffic

Should not be used where frequent utility cuts are likely

Use of this material generally requires a maintenance agreement

**Design**
Crosswalks generally should comply with MUTCD standards

Paver size: minimum 4 inches for shortest dimension, maximum 30 inches for longest dimension, minimum 5–inches thickness for vehicular roadbed

Pavers that have a ratio of length to width greater than 2:1 should only be used when set in poured concrete because of the likelihood of breakage under heavy-vehicle traffic

Granite must have a textured surface that provides sufficient slip resistance to meet a minimum 0.60 coefficient of friction when wet


**Sustainability Opportunities**
Salvaged pavers
**Thermoplastic Imprinting**

**USAGE: OPTIONAL**

Thermoplastics applied into grooves created by heating and imprinting the asphalt.

**Benefits**

- Visually enhances crosswalk
- Preserves existing asphalt surface
- Because the thermoplastics are imprinted below the level of the road surface, the application will not begin to wear until about ¼ inch of the asphalt has been worn away, resulting in a longer lifespan than typical thermoplastic crosswalks markings

**Considerations**

As in any other application, thermoplastics will wear the most at the points of greatest abrasion from vehicle tires and may need to be touched-up or re-applied within 5 to 10 years.

**Application**

Thermoplastic imprinting can be used on any crosswalk on an asphalt roadbed.

Avoid where frequent utility cuts are likely.

Use of this material generally requires a maintenance agreement.

**Design**

Crosswalks generally should comply with MUTCD standards.

Color and pattern can be customized.

Specification source: NYC DOT Standard Specifications section 6.45 A
Sidewalks are paths for pedestrians alongside a road (see Glossary). The primary function of a sidewalk is to provide pedestrian movement and access to buildings and lots, parks, and other destinations. However, sidewalks also function as a site for loading and unloading vehicles, as public meeting and gathering spaces, as a place for outdoor dining, a venue for commerce or expression, and sometimes as an opportunity to beautify the streetscape with natural vegetation. Sidewalks require pedestrian ramps with detectable warning strips at all crossings, as described in the ADA Standards for Accessible Design.
Untinted Concrete

**USAGE: STANDARD**

Mixture comprised of cement(s), aggregate(s), water, and other chemical admixtures, smoothed and then allowed to harden, forming a solid sidewalk surface.

**Benefits**

Provides durable and frictionally excellent sidewalk surface

This material is widely available and cost effective

**Considerations**

Difficult to patch in sections where utility cuts or defects occur

**Application**

Appropriate for sidewalks on all non-commercial and non-historic streets and select commercial streets unless otherwise specified

Other options should be evaluated where frequent utility cuts are likely

Adjacent property owners are generally responsible for maintaining this material

**Design**

Flag size: 5 feet by 5 feet

Joint: “tooled joint” or simulated saw-cut joint scoring patterns

Typically requires 6-inch gravel base

May require metal reinforcement bars as specified by NYC DOT

Specification source: NYC DOT Standard Specifications sections 2.02, 2.15, 2.22, 3.05, 4.13

Detail source: NYC DOT Standard Details drawing# H–1045

**Sustainability Opportunities**

Supplementary cementitious materials (SCM)
Tinted Concrete

**USAGE: STANDARD*/HISTORIC**

Same mixture as untinted concrete, but with a pigment. Also used in historic districts to simulate historic pavers that cannot be replaced in kind, as per LPC guidelines.

* Pending regulatory change, this material may be standard only for commercial districts C4–4 through C4–7, C5 and C6, as defined in the Zoning Resolution of the City of New York.

**Benefits**

- Dark tinting visually enhances sidewalk and emphasizes urban character in areas with greatest commercial and retail density
- Reinforces historic character (if applicable)
- Scored joints provide cleaner look, simulating individually hewn blocks of stone.

**Considerations**

See considerations for UNTINTED CONCRETE

**Application**

- Standard in commercial districts C4–4 through C4–7, C5 and C6, as defined in the Zoning Resolution of the City of New York
- Required in historic districts when bluestone or granite is being replaced, as per LPC guidelines
- Adjacent property owners are generally responsible for maintaining this material

**Design in Commercial Districts**

- Flag size: 5 feet by 5 feet
- Pigmenting: 3% Light Grey Portland Cement
- Joint: simulated saw-cut joint scoring
- Typically requires 6-inch gravel base
- May require metal reinforcement bars as specified by NYC DOT

**Design In Historic Districts**

- Flag size and pigmenting to match existing pavers as per LPC guidelines
- Joint: “tooled joint” scoring
- Typically requires 6-inch gravel base
- May require metal reinforcement bars as specified by NYC DOT
- Specifications and standard details available in the LPC guidelines

**Sustainability Opportunities**

See sustainability opportunities for UNTINTED CONCRETE
**Tinted Concrete with Exposed Light-Colored Aggregate**

**USAGE: OPTIONAL**

Same mixture as tinted concrete, but with addition of exposed light-colored pebble-sized aggregate. Joints are scored to simulate saw-cutting.

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**Benefits**

- Exposed aggregate creates a texture and more natural appearance
- Exposed aggregate camouflages dirt and gum

**Considerations**

See considerations for TINTED CONCRETE

**Application**

- This material is recommended for commercial areas with high foot traffic
- Because this is an optional sidewalk treatment, it is best used when applied to entire blocks, rather than to the sidewalks of individual small properties which would create a “patchwork” effect

**Adjacent property owners are generally responsible for maintaining this material**

**Design**

- See design guidance for TINTED CONCRETE
- Aggregate: pebble-sized, light in color
- Aggregate specification source: NYC DOT Standard Specifications section 4.13 E, item numbers 4.13 EAGG (for four-inch sidewalk), 4.13 EBGG (for seven-inch sidewalk)

**Sustainability Opportunities**

See sustainability opportunities for TINTED CONCRETE
Tinted Concrete with Silicon Carbide Treatment

**USAGE: OPTIONAL**

Same mixture as tinted concrete, but treated with silicon carbide to add sparkle.

### Benefits
- See benefits of TINTED CONCRETE (3.3.1a)
- Sparkle adds distinction and visual enhancement to tinted concrete
- Increases slip resistance of surface

### Considerations
- See considerations for TINTED CONCRETE

### Application
- This material is appropriate for sidewalks in commercial districts
- Because this is an optional sidewalk treatment, it is best used when applied to entire blocks, rather than to the sidewalks of individual small properties which would create a “patchwork” effect
- **Adjacent property owners are generally responsible for maintaining this material**

### Design
- See design guidance for TINTED CONCRETE
- Silicon carbide specification source: NYC DOT Standard Specifications section 4.13

### Sustainability Opportunities
- See sustainability opportunities for TINTED CONCRETE
Sand-Colored Concrete with Exposed Aggregate

**Usage: Optional**

Same mixture as tinted concrete, but sand-colored, and with multi-colored pebble-sized exposed aggregate.

**Benefits**

See benefits of tinted concrete with exposed light-colored aggregate (3.3.1b)

Sand color reinforces natural character of open spaces

**Considerations**

See considerations for tinted concrete with exposed light-colored aggregate

**Application**

This material is appropriate for sidewalks adjacent to waterfronts and open spaces

Because this is an optional sidewalk treatment, it is best used when applied to entire blocks, rather than to the sidewalks of individual small properties which would create a “patchwork” effect

**Adjacen property owners are generally responsible for maintaining this material**

**Design**

See design guidance for tinted concrete with exposed light-colored aggregate

Pigmenting: sand-colored

Aggregate: pebble-sized, mixed-color river rock

Specification source: NYC DOT Standard Specifications section 4.13 ESA (for four-inch sidewalks), 4.13 ESB (for seven-inch sidewalks)

**Sustainability Opportunities**

See sustainability opportunities for tinted concrete with exposed light-colored aggregate
Porous Concrete

**Usage: Pilot**

Concrete mixture using minimal cementitious materials to coat the aggregate, and using little or no sand, leaving substantial void content through which water can drain.

**Benefits**
- See benefits of Untinted Concrete (3.3.1)
- Allows stormwater to drain through to soil, reducing runoff into the sewer system
- May reduce likelihood of ponding and slick or icy sidewalk conditions
- May be less prone to cracking in winter than conventional concrete

**Considerations**
- See considerations for Untinted Concrete
- Not appropriate for use where there is water-sensitive subsurface infrastructure
- Not effective at greater than 5% slope
- Only certain soil types are appropriate as subbases for infiltration
- Porosity can convey harmful chemicals into the soil
- May require routine vacuuming of surface to maintain porosity

**Application**
- On a level street above the high water table with low pedestrian traffic and no vehicular encroachment
- Must have adequate subsurface conditions to detain stormwater
- Can be used to pave an entire sidewalk, or just over the trench of Connected Tree Pits (2.4.1b)
- Avoid where there is potential for soil contamination
- Should not be used where frequent utility cuts are likely
- Use of this material generally requires a maintenance agreement

**Design**
- See design guidance for Untinted Concrete
- Requires 18– to 36–inch stone infiltration bed with detention system and/or overflow controls, and even distribution of stormwater
- Bottom of infiltration bed should be at least 3 feet above high water table and 2 feet above bedrock

**Sustainability Opportunities**
- See sustainability opportunities for Untinted Concrete
London Pavers

**Usage: Optional**

Large precast concrete pavers laid in a staggered pattern.

**Benefits**

See benefits of Untinted Concrete (3.3.1)

- Reinforces civic character of area
- Less expensive than stone paver alternatives

**Considerations**

Unit pavers can become loose over time and will require regular maintenance

**Application**

For sidewalks fronting on city, state or federally-owned buildings and other civic structures such as bridges, courthouses, libraries, and memorials.

Because this is an optional sidewalk treatment, it is best used when applied to entire blocks, rather than to the sidewalks of individual small properties which would create a “patchwork” effect

Use of this material generally requires a maintenance agreement

**Design**

- Paver size: 18 inches by 36 inches
- Requires concrete base
- Specification source: NYC DOT Standard Specifications section 6.06 LP

**Sustainability Opportunities**

See sustainability opportunities for Untinted Concrete

London pavers: Brooklyn Bridge Pedestrian Access Ramp, Manhattan

London pavers: (note: this example shows a non-standard size): Washington, DC
Mastic Asphalt

Usage: Pilot

Asphalt with high binder content, spread onto a concrete or compacted gravel base.

Benefits
- Provides durable and frictionally excellent sidewalk surface
- Easier and less expensive to install and replace than concrete
- Can be patched in sections
- Can be hand-spread without the use of rollers
- Can be transported solid and re-melted on site

Considerations
- Initial skid resistance is lower until binder film is worn away from surface

Application
- Appropriate for areas without existing sidewalks, but not in historic or commercial districts
- Use of this material generally requires a maintenance agreement

Design
- May require concrete base
- Mastic asphalt or stone mastic asphalt (SMA) must have 6–10% binder content
- Large coated chippings can be used to increase slip resistance

Sustainability Opportunities
- High recycled asphalt (RAP) content
- High albedo asphalt
Hexagonal Asphalt Pavers

**Usage:** Optional

Asphalt pre-cast into hexagonally-shaped pavers.

**Benefits**
- Widely-used paver for New York City public spaces conveys park-like character
- Interlocking hexagonal shape fits tightly together and resists shifting and buckling
- This material is widely available and cost effective
- Dark color hides dirt and stains
- Hexagonal pavers are relatively easy to reset or replace, especially for utility access
- Asphalt pavers can be recycled

**Application**
- Hexagonal asphalt pavers are appropriate for sidewalks adjacent to parks or plazas.
- Use of this material generally requires a maintenance agreement

**Design**
- Paver size: 8 inches between parallel sides
- Can be sand-set for easier installation or mortar-set for stronger structural properties
- Specification source: NYC DOT Standard Specifications sections 3.04, 6.60

**Sustainability Opportunities**
- High recycled asphalt (RAP) content
Bluestone Flags

**USAGE: HISTORIC**

Historic stone unit paver with subtle variations in color, grain, and surface.

### Benefits
- Reinforces historic character
- Adds distinction and visual enhancement to sidewalk
- Stone conveys connection to natural environment

### Considerations
- Vulnerable to breakage when driven over by vehicles
- Due to the possibility of pavers cracking or becoming uneven, application requires attentive maintenance.

### Design
- Bluestone: 2¼-inch thick New York State bluestone, to match size and color of existing flags
- Finish: Natural cleft, with variation in smoothness not exceeding ¼ inch
- Joints: Hand-tight
- Specification sources: LPC guidelines, NYC DOT Standard Specifications section 6.07

### Application
- This material is standard in historic districts or other areas with existing bluestone pavers where historic fabric remains intact, as per the LPC guidelines.

### Adjacent property owners are generally responsible for maintaining this material in Landmark districts

### Sustainability Opportunities
- Salvaged bluestone
Granite Slabs

**USAGE: HISTORIC**

Historic stone paver, with varieties of color, texture and veining. Can be cut to extremely large sizes to span underground vaults.

**Benefits**
- Reinforces historic character
- Adds distinction and visual enhancement to sidewalk
- Stone conveys connection to natural environment

**Considerations**
- Not intended to support heavy vehicles when spanning underground vaults
- Difficult to repair or patch in sections

**Application**
- This material is standard in historic districts or other areas with existing granite pavers where historic fabric remains intact, as per the LPC guidelines

**Adjacent property owners are generally responsible for maintaining this material in Landmark districts**

**Design**
- Granite: to match size and color of existing flags, 3-inch minimum thickness
- Slip resistance: minimum 0.60 coefficient of friction wet

**Sustainability Opportunities**
- Salvaged granite slabs
Rubber Pavers

**USAGE: PILOT**

Interlocking sidewalk pavers made of recycled rubber or a rubber/plastic mix.

**Benefits**
- Easy to install and replace
- Pavers can be shaped to avoid trees or other objects
- Thinner than traditional sidewalk, allowing more room for roots to grow
- Permeability of the joints allows stormwater to filter through to tree roots
- Permeability helps to reduce the formation of the condensation commonly seen under traditional concrete flags which promotes the aggressive root growth that tends to cause fracturing and upheaval

**Considerations**
- Semi–permeability generates some stormwater runoff
- Unit pavers can become uneven over time and will require regular maintenance

**Application**
- Appropriate for piloting on sidewalks or plazas with low pedestrian traffic where tree roots may cause the fracturing and upheaval of sidewalk paving.
- Use of this material generally requires a maintenance agreement

**Design**
- Recycled rubber must be free of high–risk chemicals or otherwise sealed to prevent contamination of soil
- Paver size: 2 feet by 2.5 feet
- Various colors available

**Sustainability Opportunities**
- Recycled rubber
- High SRI value coloring
Sidewalk Furnishing Zones

The furnishing zone is the area of the sidewalk immediately adjacent to the curb where street trees, signs, above-ground utilities, and street furniture are typically located (see Glossary). Furnishing zones provide a physical buffer and a visual transition between the vehicles in the roadbed and the pedestrians on the sidewalk, while also affording a clear area for organizing the various elements of street furniture that might otherwise appear cluttered. This area is generally 5 feet wide, or as wide as the tree pits along the blockface. Eight feet, or one half of the sidewalk width, whichever is greater, must be maintained for unobstructed pedestrian passage. The furnishing zone of any sidewalk with a clear path of less than 8 feet should be built out of the same material as the adjacent sidewalk.

Furnishing zones are most appropriate on streets with at least moderate levels of both pedestrian and vehicle traffic—usually commercial shopping streets. Furnishing zones are best used when applied to entire blocks or a series of blocks comprising a corridor, rather than to sidewalks in front of individual small properties which would create a “patchwork” effect. In addition to the materials listed in this section, all materials listed in the Sidewalks section may be used in furnishing zones as well, according to the application guidance provided.
Granite Block

**USAGE: OPTIONAL**

Historic smooth–finish granite block unit pavers often referred to as “cobblestones,” commonly used throughout New York City in the 19th Century.

**Benefits**
- Visually delineates separation of street uses
- Stones convey connection to natural environment
- Cobblestones are relatively easy to remove and reset, especially for utility access

**Considerations**
- Stones can become loose over time and will require regular maintenance
- Can be slippery when wet
- Uneven surface can hinder pedestrian and disabled persons’ mobility

**Application**
- Can be used on streets where pedestrians will not typically be forced to walk in the furnishing zone

**Use of this material generally requires a maintenance agreement**

**Design**
- Should be sand–set for easier installation and greater permeability wherever impermeable installation generates stormwater runoff
- Can be mortar set for stronger structural properties
- The area within 18 inches of the curb should be kept free of obstructions

**Specification source:** NYC DOT

Standard Specifications sections 2.06, 6.06

**Sustainability Opportunities**
- Salvaged cobbles
- Permeable installation

Cobblestones used in a furnishing zone: Battery Park City, Manhattan
Concrete Cobbles

Usage: Optional

Precast concrete cobbles designed to simulate granite block pavers.

### Benefits
- See benefits of GRANITE PAVERS (3.4.1)
- Less expensive than natural stone alternatives

### Considerations
- See considerations for GRANITE PAVERS

### Application
- See application guidance for GRANITE PAVERS
- Use of this material generally requires a maintenance agreement

### Design
- See design guidance for GRANITE PAVERS
- Specification source: NYC DOT Standard Specifications section 6.06

### Sustainability Opportunities
- See sustainability opportunities for GRANITE PAVERS
### Modular Cobblestones

**Usage:** Optional

A pre-assembled grid of smooth saw-cut finish granite cobbles fastened to a sturdy backing and installed as modular tiles.

#### Benefits
- Easier to install and maintain than traditional cobblestone
- Smooth, saw-finish stones do not hinder pedestrian or cyclist mobility

#### Considerations
- Exact lifecycle of product is unknown
- Impermeability generates stormwater runoff

#### Application
- This material is appropriate for furnishing zones in high-traffic areas
- Consider permeable paving options adjacent to trees and planted areas
- Use of this material generally requires a maintenance agreement

#### Design
- Requires concrete base
- Various colors and styles available
- Specification source: NYC DOT Standard Specifications section 6.06 A

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*Modular cobblestone pedestrian street: Broad Street at Wall Street, Manhattan*
Square Asphalt or Concrete Pavers

USAGE: OPTIONAL

Precast square–shaped asphalt pavers.

Benefits
This material is widely available and cost effective
Relatively easy to reset or replace, especially for utility access
Asphalt pavers can be recycled

Considerations
Unit pavers can become loose over time and will require regular maintenance

Application
Can be used on streets where pedestrians will not typically be forced to walk in the furnishing zone

Use of this material generally requires a maintenance agreement

Design
Paver size: 8 inches by 8 inches
Should be sand–set for easier installation and greater permeability wherever impermeable installation generates stormwater runoff
Can be mortar set for stronger structural properties
The area within 18 inches of the curb should be kept free of obstructions
Specification source: NYC DOT Standard Specifications section 6.6 A

Sustainability Opportunities
High recycled asphalt (RAP) content
High SRI value coloring

Square asphalt pavers in a furnishing zone: Willoughby Street at Duffield Street, Brooklyn
Concrete with Exposed Glass Aggregate

**Usage: Optional**

Select surface aggregates (such as colored glass or decorative pebbles) embedded and fully adhered to concrete, either poured and cast-in-place as traditional concrete sidewalk, or as precast unit pavers.

**Benefits**
- Decorative glass adds distinction and visual enhancement to concrete
- Increases slip resistance of surface
- As precast pavers, relatively easy to reset or replace, especially for utility access

**Considerations**
- Unit pavers can become loose over time and will require regular maintenance

**Application**
- The material, when poured and cast-in-place, is appropriate for all furnishing zones and plazas
- When installed as precast pavers, it can be used on streets where pedestrians will not typically be forced to walk in the furnishing zone
- When cast-in-place, should not be used where frequent utility cuts are likely

**Use of this material generally requires a maintenance agreement**

**Design**
- Slip resistance: minimum 0.60 coefficient of friction wet
- Joint: simulated saw-cut joint scoring

Pavers should be sand-set for easier installation and greater permeability wherever impermeable installation generates stormwater runoff

Pavers can be mortar set for stronger structural properties

The area within 18 inches of the curb should be kept free of obstructions

When used as pavers, paver size: 8 inches by 8 inches

When poured, may require metal reinforcement bars as specified by NYC DOT

Unlimited color and aggregate mix options available

Specification source: NYC DOT Standard Specifications sections 4.13 EG, item numbers 4.13 EGA (for four-inch sidewalks), 4.13 EGB (for seven-inch sidewalks), 6.47 EGA8 (for pavers)

**Sustainability Opportunities**
- Supplementary cementitious materials (SCM)
- High SRI value coloring
- Recycled glass or reclaimed aggregates
Curbs

A curb is a step where the roadbed meets the sidewalk or other raised pathway (see Glossary). Curbs serve three functions: a visual and physical limit to the vehicular roadbed; a gutter to convey rainwater and detritus from the roadbed and sidewalks to the catch basins at the ends of the street; and aesthetically, curbs add a finished edge to sidewalks and roadbeds. Sidewalks require pedestrian ramps with detectable warning strips at all crossings as described in the ADA Standards for Accessible Design.
Untinted Concrete

**USAGE: STANDARD**

Mixture comprised of cement(s), aggregate(s), water, and other chemical admixtures, smoothed and then allowed to harden, forming a solid curb.

**Benefits**
- This material is widely available and cost effective
- Can easily be cast on site to fit curved sidewalk profiles
- Cast-in-place curbs are more resistant to displacement than stone alternatives

**Considerations**
- Vulnerable to breakage if repeatedly mounted by heavy vehicles

**Application**
- This material is standard for any street with untinted concrete sidewalks
- This material is generally maintained by NYC DOT

**Design**
- Size: 6 inches wide on top, 8 inches wide on bottom, 18 inches deep
- Expansion joints of curb should line up with expansion joints of sidewalk

Steel facing should be used on streets where repeated mounting by heavy vehicles may cause damage.
- May require metal reinforcement bars as specified by NYC DOT
- Specification source: NYC DOT Standard Specifications section 4.08, 3.05
- Steel-faced specification source: NYC DOT Standard Specifications section 2.13, 3.05, 4.09
- Detail source: NYC DOT Standard Details drawing# H–1044
- Steel-faced detail source: NYC DOT Standard Details drawing# H–1010

**Sustainability Opportunities**
- Supplementary cementitious materials (SCM)
- Salvaged or recycled steel facing
3.5.1a Tinted Concrete

**Tinted Concrete**

**USAGE: STANDARD**

Same mixture as untinted concrete, but with a pigmented admixture to produce a color equivalent to the standards of the LPC.

**Benefits**

See benefits of UNTINTED CONCRETE (3.5.1)

**Considerations**

See considerations for UNTINTED CONCRETE

**Application**

This material is standard for any street with tinted concrete sidewalks.

This material is generally maintained by NYC DOT

**Design**

See design guidance for UNTINTED CONCRETE

Pigmenting: 3% Light Grey Portland Cement

Pigmenting specification source: NYC DOT Standard Specifications section 2.19

**Sustainability Opportunities**

See sustainability opportunities for UNTINTED CONCRETE
**Integral Concrete Curb and Gutter**

**USAGE: OPTIONAL**

Concrete curb and gutter precast as single pieces and laid in sections.

**Benefits**
- Easier to install and maintain than cast-in-place alternatives
- Can be removed and replaced as needed

**Considerations**
See considerations for **UNTINTED CONCRETE** (3.5.1)

**Application**
- Appropriate for residential areas with low volumes of heavy vehicles

**Design**
Specification source: NYC DOT
Standard Specifications section 4.08 CG

**Sustainability Opportunities**
See sustainability opportunities for **UNTINTED CONCRETE**
Use of porous concrete where possible

Precast concrete curb and gutter sections laid end-to-end. Photo shows optional sidewalk extension in background: Miami Beach, FL.
Granite

USAGE: OPTIONAL/HISTORIC

Granite cut to long sections and laid as curbing. Saw–finishing, achieved by cutting the granite with a stone saw and polishing out saw marks, provides a smooth, clean look. Split finishing, typically achieved by hand–chiseling, exposes the natural cleft of the stone, giving a rough–hewn texture.

Benefits

- Reinforces historic character (if applicable)
- Adds distinction and visual enhancement to sidewalk
- Stone conveys connection to natural environment
- Extremely durable and low–maintenance, resists cracking and discoloration
- Can be removed and replaced as needed

Considerations

- Difficult to patch and must therefore be replaced by section if severely damaged
- Much higher material cost than concrete

Application

- This material is appropriate for all streets, especially commercial districts, including use in combination with concrete sidewalk
- Granite curb should be used in historic districts or areas with existing granite curb where the historic fabric remains intact

This material is generally maintained by NYC DOT

Design

- Size: 5 inches to 8 inches wide on top, 3 inches of minimum width on bottom, 16 inches deep
- Must have lip with batter and rounded edge
- Slip resistance at top of curb: minimum 0.60 coefficient of friction when wet

Specification source: NYC DOT Standard Specifications section 2.12, 4.07

Saw–finish curb detail source: NYC DOT Standard Detail drawing# H–1056

Split–finish curb detail source: NYC DOT Standard Detail drawing# H–1056A

Sustainability Opportunities

- Salvaged granite curb

Split–finish granite curb shown with concrete sidewalk: Houston Street at LaGuardia Place, Manhattan

Saw–finish granite curb shown with historic bluestone sidewalk: Madison Avenue at East 51st Street, Manhattan
Plazas

A plaza is a public space in the city that provides a place for people to enjoy the public realm (see Glossary). Unlike a sidewalk, a plaza is a destination rather than a space to pass through.

In addition to the materials listed in this section, all materials listed in the Sidewalks section and the Sidewalk Furnishing Zones section may be used in plazas as well, according to the application guidance provided.
**Imprinted Asphalt**

**USAGE: OPTIONAL**

Machine–heated asphalt, imprinted with pattern templates and colored with protective coating.

**Benefits**
- Visually defines pedestrian or non–vehicle areas
- Can be installed on existing asphalt that is in good condition
- More cost–effective than unit pavers
- Easier to maintain than unit pavers

**Application**
- Appropriate for plazas where traditional unit pavers are desired, but asphalt road surface must be preserved, or where cost or maintenance considerations prohibit unit pavers

**Use of this material generally requires a maintenance agreement**

**Design**
- Can be installed on existing asphalt that is in good condition
- Various patterns and colors available
- Specification source: NYC DOT Standard Specifications section 6.45B

**Sustainability Opportunities**
- High recycled asphalt (RAP) content
- High SRI value coloring

*Imprinted asphalt in a plaza: Drumgoole Plaza (Gold Street at Frankfort Street), Manhattan

*Imprinted asphalt in a plaza: Genova, Italy (Credit: Integrated Paving Concepts*)
**Hexagonal Concrete Pavers**

**Usage:** Optional

Concrete precast into hexagonally shaped pavers.

**Benefits**

- Interlocking hexagonal shapes fit tightly together and resist shifting and buckling
- Hexagonal pavers are relatively easy to reset or replace, especially for utility access

**Considerations**

- Unit pavers can become loose over time and will require regular maintenance

**Application**

- This material is appropriate for all plazas
- Use of this material generally requires a maintenance agreement

**Design**

- Paver size: 16 inches between parallel sides

**Sustainability Opportunities**

- Supplementary cementitious materials (SCM)
Decorative Gravel

**USAGE: OPTIONAL**

Small size decorative gravel or aggregate spread on top of a sturdy earthen or cementitious base.

**Benefits**
- Adds visual enhancement
- Stones convey connection to natural environment
- Highly slip-resistant

**Considerations**
- Can be difficult to remove litter from gravel
- Snow cannot be plowed or shoveled from surface
- Gravel must be replenished every few years
- Impermeable installation generates stormwater runoff

**Application**
Decorative gravel can be used in low pedestrian traffic areas interior to public spaces

**Use of this material generally requires a maintenance agreement**

**Design**
- Surface must be level and include a flush border of edging material to contain the gravel
- Should be sited at the interior of plazas, not in pedestrian pathways
- Various colors and aggregate styles available

**Sustainability Opportunities**
- Permeable installation
- Reclaimed gravel

Decorative gravel seating area: Bryant Park, Manhattan
Resin-Bound Gravel

**USAGE: OPTIONAL**

Colored gravel that is scattered across an existing solid surface and epoxied by means of a transparent or colored resin.

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**Benefits**

- See benefits of DECORATIVE GRAVEL (3.6.3)
- Extremely slip resistant
- More cost-effective than loose gravel
- Easier to maintain than loose gravel

**Considerations**

- Difficult to replace or patch in sections where utility cuts or defects occur
- Impermeability generates stormwater runoff

**Application**

Resin-bound gravel can be used in temporary plazas and pedestrian spaces built on top of the existing roadbed (to be replaced with permanent materials at a later date), or where decorative gravel is desired but asphalt road surface must be preserved.

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This material is not recommended for long-term applications, especially where there are sub-surface utilities because of difficulty patching.

**Use of this material generally requires a maintenance agreement**

**Design**

- Various colors available
- Specification source: NYC DOT
- Standard Specifications section 6.04RG

**Sustainability Opportunities**

- Reclaimed gravel

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Resin-bound gravel treatment applied to existing asphalt roadway to create a temporary pedestrian plaza: 9th Avenue at West 14th Street, Manhattan