

# 3 Materials

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<b>3.1 Roadway</b>					
3.1.1	Asphaltic Concrete	●			
3.1.1a	Imprinted Asphalt		●		
3.1.1b	High Albedo Asphalt				●
3.1.1c	Porous Asphalt				●
3.1.2	Concrete	●			
3.1.3	Granite Block		●	●	
3.1.3b	Modular Cobblestones		●		
3.1.4	Permeable Asphalt or Concrete Pavers				●
<b>3.2 Crosswalk</b>					
<i>Same as Roadway</i>					
3.1.1	Asphaltic Concrete	●			
3.1.1a	Imprinted Asphalt		●		
3.1.1b	High Albedo Asphalt				●
3.1.1c	Porous Asphalt				●
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3.1.3	Granite Block		●	●	
3.1.3b	Modular Cobblestones		●		
3.1.4	Permeable Asphalt or Concrete Pavers				●
3.2.1	Granite Pavers		●		
3.2.2	Thermoplastic Imprinting		●		
<b>3.3 Sidewalks</b>					
3.3.1	Untinted Concrete	●			
3.3.1a	Tinted Concrete	●		●	
3.3.1b	Tinted Concrete with Exposed Light-Colored Aggregate		●		
3.3.1c	Tinted Concrete with Silicon Carbide Treatment		●		
3.3.1d	Sand-Colored Concrete with Exposed Aggregate		●		
3.3.1e	Porous Concrete				●
3.3.1f	London Pavers		●		
3.3.2	Mastic Asphalt				●
3.3.3	Hexagonal Asphalt Pavers		●		
3.3.4	Bluestone Flags			●	
3.3.5	Granite Slabs			●	
3.3.6	Rubber Pavers				●
<b>3.4 Sidewalk Furnishing Zones</b>					
<i>Same as Sidewalk</i>					
3.3.1	Untinted Concrete	●			
3.3.1a	Tinted Concrete	●		●	
3.3.1b	Tinted Concrete with Exposed Light-Colored Aggregate		●		
3.3.1c	Tinted Concrete with Silicon Carbide Treatment		●		

Section	Material	Standard	Optional	Historic	Pilot
3.3.1d	Sand-Colored Concrete with Exposed Aggregate		●		
3.3.1e	Porous Concrete				●
3.3.1f	London Pavers		●		
3.3.2	Mastic Asphalt				●
3.3.3	Hexagonal Asphalt Pavers		●		
3.3.4	Bluestone Flags			●	
3.3.5	Granite Slabs			●	
3.3.6	Rubber Pavers				●
3.4.1a	Concrete Cobbles		●		
3.4.1b	Modular Cobblestones		●		
3.4.2	Square Asphalt Pavers		●		
3.4.3	Concrete with Exposed Glass Aggregate		●		
<b>3.5 Curbs</b>					
3.5.1	Concrete	●			
3.5.1a	Tinted Concrete	●			
3.5.1b	Granite		●	●	
3.5.2	Integral Concrete Curb and Gutter		●		
<b>3.6 Plazas</b>					
<i>Same as Sidewalk Furnishing Zones</i>					
3.3.1	Untinted Concrete	●			
3.3.1a	Tinted Concrete	●		●	
3.3.1b	Tinted Concrete with Exposed Light-Colored Aggregate		●		
3.3.1c	Tinted Concrete with Silicon Carbide Treatment		●		
3.3.1d	Sand-Colored Concrete with Exposed Aggregate		●		
3.3.1e	Porous Concrete				●
3.3.1f	London Pavers		●		
3.3.2	Mastic Asphalt				●
3.3.3	Hexagonal Asphalt Pavers		●		
3.3.4	Bluestone Flags			●	
3.3.5	Granite Slabs			●	
3.3.6	Rubber Pavers				●
3.4.1a	Concrete Cobbles		●		
3.4.1b	Modular Cobblestones		●		
3.4.2	Square Asphalt Pavers		●		
3.4.3	Concrete with Exposed Glass Aggregate		●		
3.6.1	Imprinted Asphalt		●		
3.6.2	Hexagonal Concrete Pavers		●		
3.6.3	Decorative Gravel		●		
3.6.3a	Resin-Bound Gravel		●		

## 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.

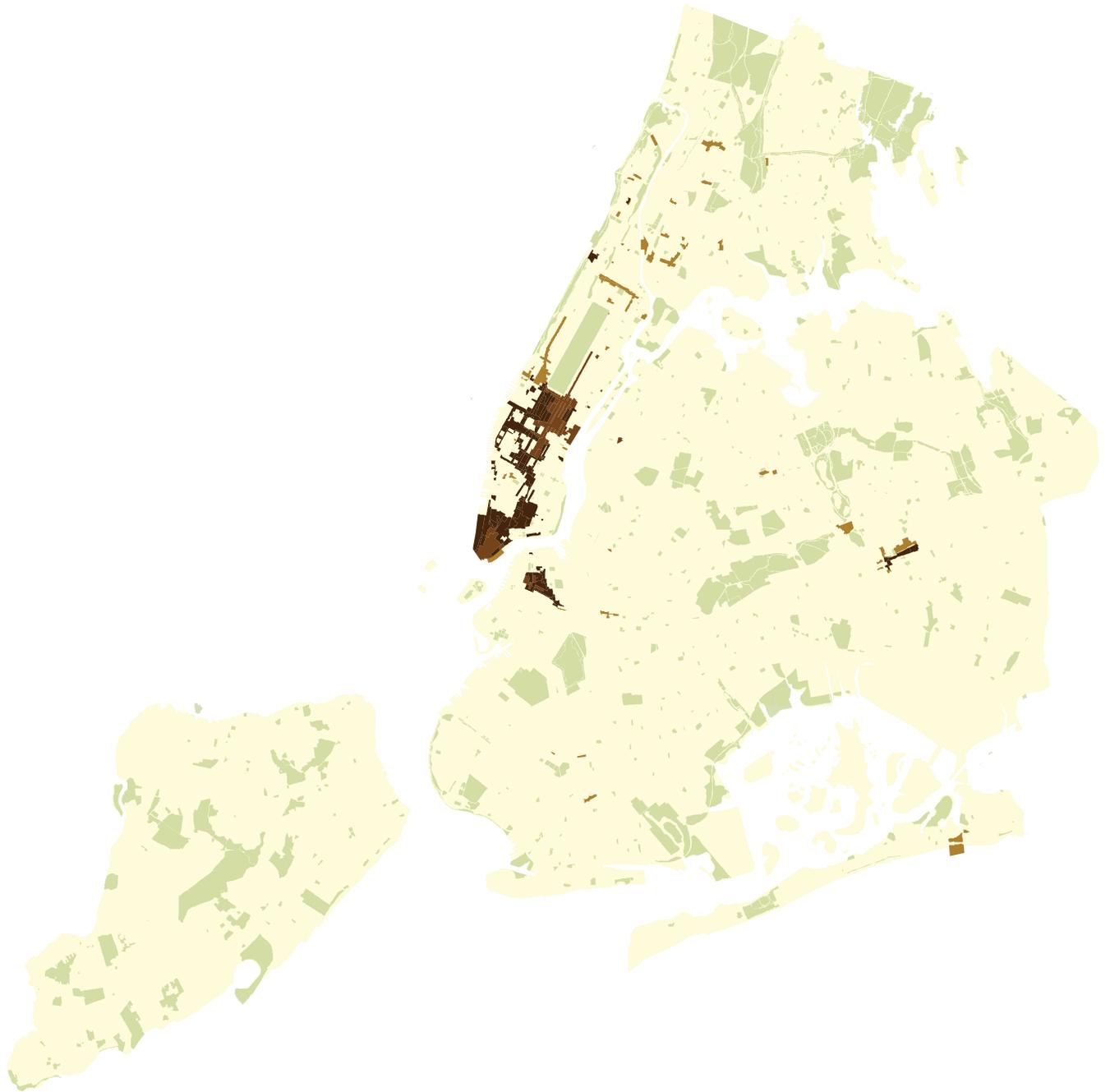
### Specification Sources

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)



**Select Commercial Zones**

- C4-4 to C4-7
- C5
- C6
- Parks

**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, Curbs, Roadways and Other Infrastructure Components* at [nyc.gov/streetdesignmanual](http://nyc.gov/streetdesignmanual). For further information, please contact the NYC DOT Bureau of Permit Management & Construction Control. For contact information visit [nyc.gov/dot](http://nyc.gov/dot) or call 311.

The Design Commission reviews distinctive sidewalks for their aesthetic impact on the streetscape. A sidewalk is considered distinctive if it deviates from that neighborhood's standard, which in most cases is Department of Transportation grey concrete with a 5-by-5-foot scoring pattern, but can include cobble or granite block in areas where the historic fabric remains intact. Designs for distinctive sidewalks in front of existing buildings are submitted through the NYC DOT. Designs for distinctive sidewalks that are part of new construction projects are submitted through the Department of Buildings. For more information, please visit the Design Commission's website at [nyc.gov](http://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](http://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.



Typical black asphalt roadway: Delancey Street at Forsyth Street, Manhattan

### 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

Material is preferred road surface for cyclists

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

### 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

## Imprinted Asphalt

**USAGE: OPTIONAL**

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



Imprinted asphalt pedestrian plaza in the roadway: 185th Street at Amsterdam Avenue, Manhattan



Taranto, Italy  
(Credit: Integrated Paving Concepts®)

Pattern and colored coating may deteriorate if exposed to regular vehicle traffic

### 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

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

### 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

### Benefits

See benefits of ASPHALTIC CONCRETE (3.1.1)

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

See considerations for ASPHALTIC CONCRETE

### Sustainability Opportunities

See sustainability opportunities for ASPHALTIC CONCRETE

High SRI value coloring

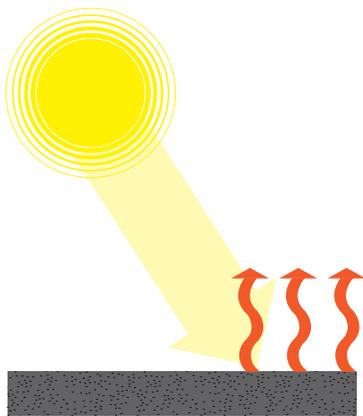
## High Albedo Asphalt

USAGE: PILOT

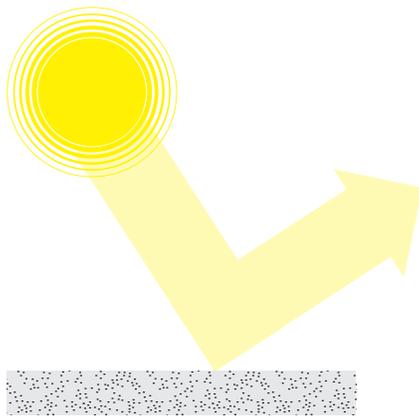
Asphalt roadway comprised of light-colored aggregate and/or binder producing high Solar Reflectance Index (SRI) values.



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)



Conventional Asphalt



High Albedo Asphalt

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

### 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.



Voids in between stones allow water to pass through (note: for demonstration purposes, this example shows a clear resin, not asphalt, to bind the aggregate particles)

### 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

Must have adequate subsurface conditions to detain stormwater

Avoid where there is potential for soil contamination

Can be used to pave an entire roadway or just the parking lane or gutter strip

Should not be piloted where frequent utility cuts are likely

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

### 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

### Design

See design guidance for ASPHALTIC CONCRETE

Aggregate should be no smaller than 600  $\mu\text{m}$ , 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



Conventional asphalt causes rainwater to pool while porous asphalt allows it to permeate the ground below

### Application

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

## 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.



Typical concrete roadbed: West Side Highway, Manhattan



Typical concrete bus pad: Manhattan Ave at 114th Street, Manhattan

### 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.



Typical cobblestone roadway: Jay Street at Hudson Street, Manhattan



Cobblestone pedestrian street: Stone Street, Manhattan

### 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

Use of this material is subject to the LPC when used in historic districts with existing cobblestones

**This material is generally maintained by NYC DOT when used in historic districts**

**Use of this material outside of historic districts generally requires a maintenance agreement**

### 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

## 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.



Modular cobblestone pedestrian street: Broad Street at Wall Street, Manhattan



Modular cobblestone installation: Broad Street at Wall Street, Manhattan (Credit: Eurocobble®)

### 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

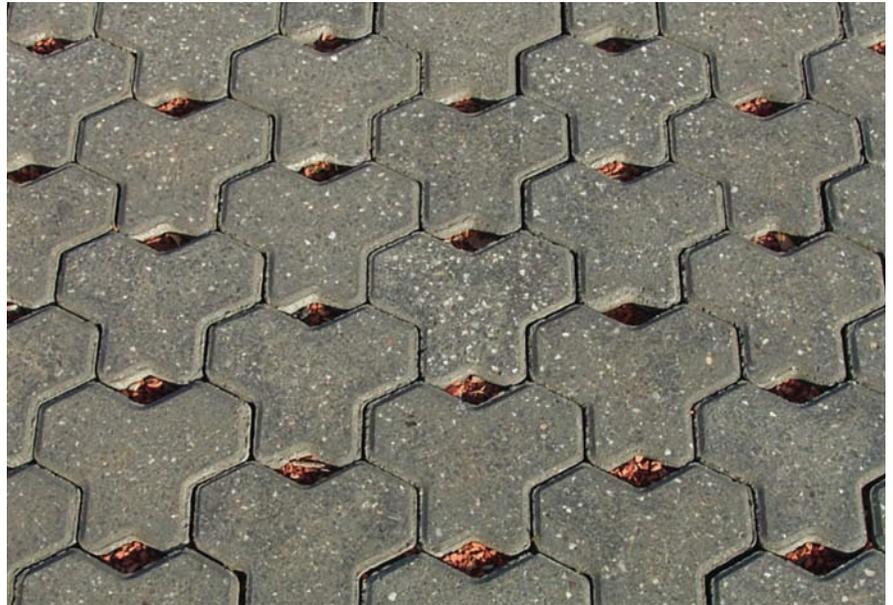
Various colors and styles available

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.



Voids between pavers allow rainwater to trickle through: Bicentennial Park, Sydney, Australia (Credit: Water Sensitive Urban Design)



Permeable paving treatment used in a parking lot: Sutherland Shire, Sydney, Australia (Credit: Water Sensitive Urban Design)

### Benefits

Similar structural properties to conventional unit pavers

Allows stormwater to drain through, reducing runoff into the sewer system

Reduces likelihood of ponding and slick or icy road conditions

### Considerations

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

Permeability can convey harmful chemicals into the soil

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

Vegetative growth in voids will occur

May require routine vacuuming of surface to maintain permeability

### Application

On a level street above the high water table with low vehicle traffic and few heavy vehicles

Must have adequate subsurface conditions to detain stormwater

Can be used to pave an entire roadway or just the parking lane or gutter strip

Avoid where there is potential for soil contamination

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

### 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.



Example of square granite pavers in a crosswalk: 48th Avenue at Center Boulevard, Queens



Long granite pavers set in poured concrete: West Side Highway, Manhattan

### 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

Specification source: NYC DOT Standard Specifications section 6.04

### Sustainability Opportunities

Salvaged pavers

## Thermoplastic Imprinting

USAGE: OPTIONAL

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



Decorative thermoplastic imprinting: Ocean City, NJ (Credit: Integrated Paving Concepts)



Close-up of thermoplastic imprinting: Seattle, WA (Credit: Integrated Paving Concepts)

### 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

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.



Typical concrete sidewalk: West Street at 16th Street, Manhattan



Concrete ribbon sidewalk: Rockaway Beach Boulevard, Queens

### 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.*



*Typical tinted concrete sidewalk with simulated saw-cut joint scoring: Broadway at Exchange Place, Manhattan*



*Bluestone pavers shown in the foreground, with tinted concrete to simulate the historic pavers shown in the background: Hudson Street at Christopher Street, Manhattan*

### Benefits

See benefits of UNTINTED CONCRETE (3.3.1)

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

Specification source: NYC DOT Standard Specifications section 4.13

### 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.



Tinted concrete sidewalk with light-colored exposed aggregate (note: this example does not include the required "simulated saw-cut joint" scoring pattern): 42nd Street at Grand Central Terminal, Manhattan

### Benefits

See benefits of TINTED CONCRETE (3.3.1a)

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)

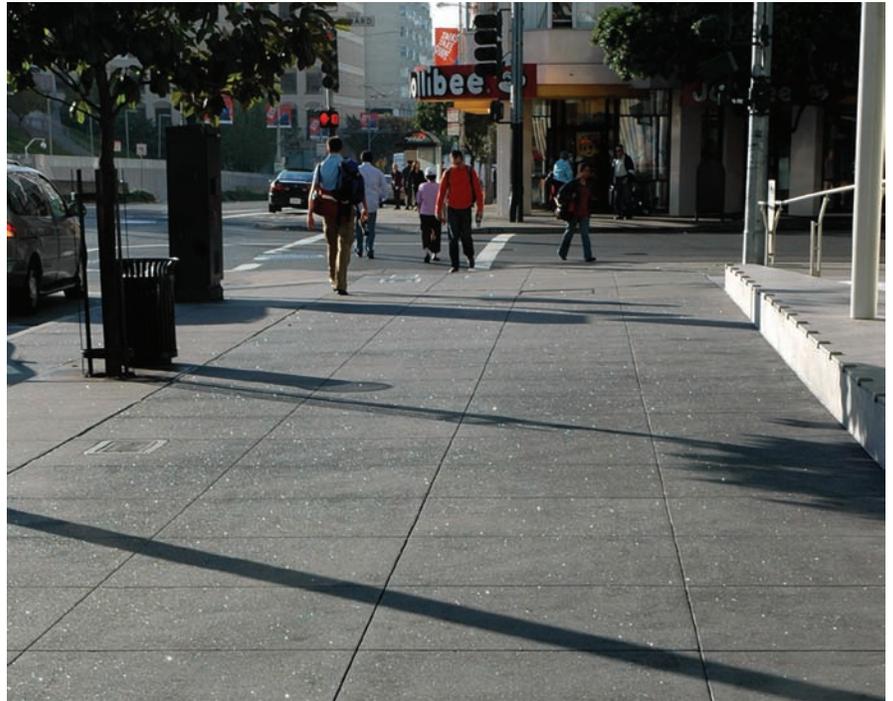
### Sustainability Opportunities

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.



Tinted concrete sidewalk with silicon carbide treatment, shown with non-standard flag size: San Francisco, CA (Credit: Flickr user "Caribb")

### 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.



Sand-colored concrete sidewalk with exposed aggregate: Prospect Park West, Brooklyn

### 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

Adjacent 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.



*Porous concrete lets water permeate down to the subsurface soil*

### 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.



*London pavers: Brooklyn Bridge Pedestrian Access Ramp, Manhattan*

### Benefits

See benefits of UNTINTED CONCRETE (3.3.1)

Reinforces civic character of area

Less expensive than stone paver alternatives

### Considerations

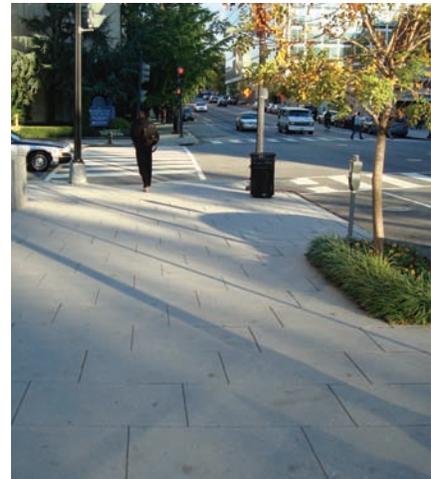
Unit pavers can become loose over time and will require regular maintenance

### 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**



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

### 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

## Mastic Asphalt

USAGE: PILOT

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



Paris, France



Paris, France

### 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.



Hexagonal asphalt paver sidewalk: Columbus Avenue at West 66th Street, Manhattan

### 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

### Considerations

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

### 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.



Bluestone flag sidewalk: Perry Street at Bleecker Street, Manhattan

### 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.

### 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**

### 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 ⅛ inch

Joints: Hand-tight

Specification sources: LPC guidelines, NYC DOT Standard Specifications section 6.07

### 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.



Granite slab sidewalk: Hudson Street at Dominick Street, Manhattan

### 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

Specification sources: LPC guidelines, NYC DOT Standard Specifications section 6.04

### Sustainability Opportunities

Salvaged granite slabs

## Rubber Pavers

**USAGE: PILOT**

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



Rubber sidewalk pavers (credit: Rubbersidewalks®)

### 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

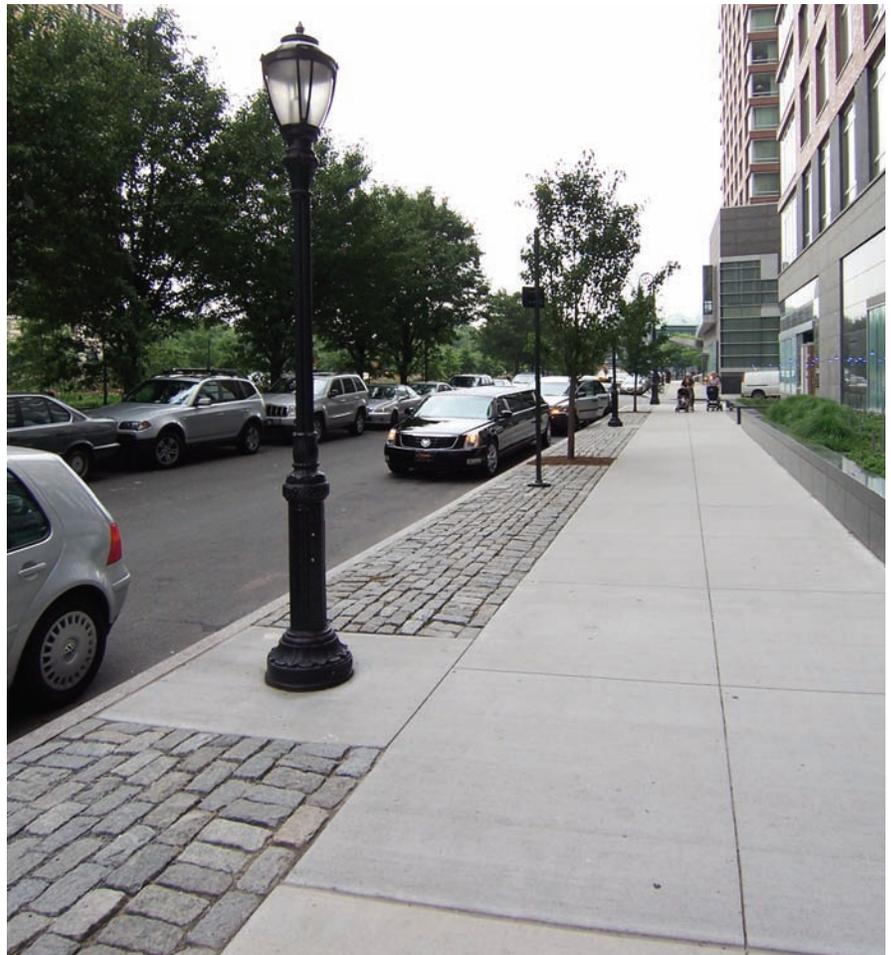
The furnishing zone is the area of the sidewalk immediately adjacent to the curb where street trees, signs, above-ground utilities, and street furniture are typically located (see Glossary). Furnishing zones provide a physical buffer and a visual transition between the vehicles in the roadbed and the 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.



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

### 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

## Concrete Cobbles

USAGE: OPTIONAL

Precast concrete cobbles designed to simulate granite block pavers.



Concrete cobble (Credit: Cobble Systems®)

### 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

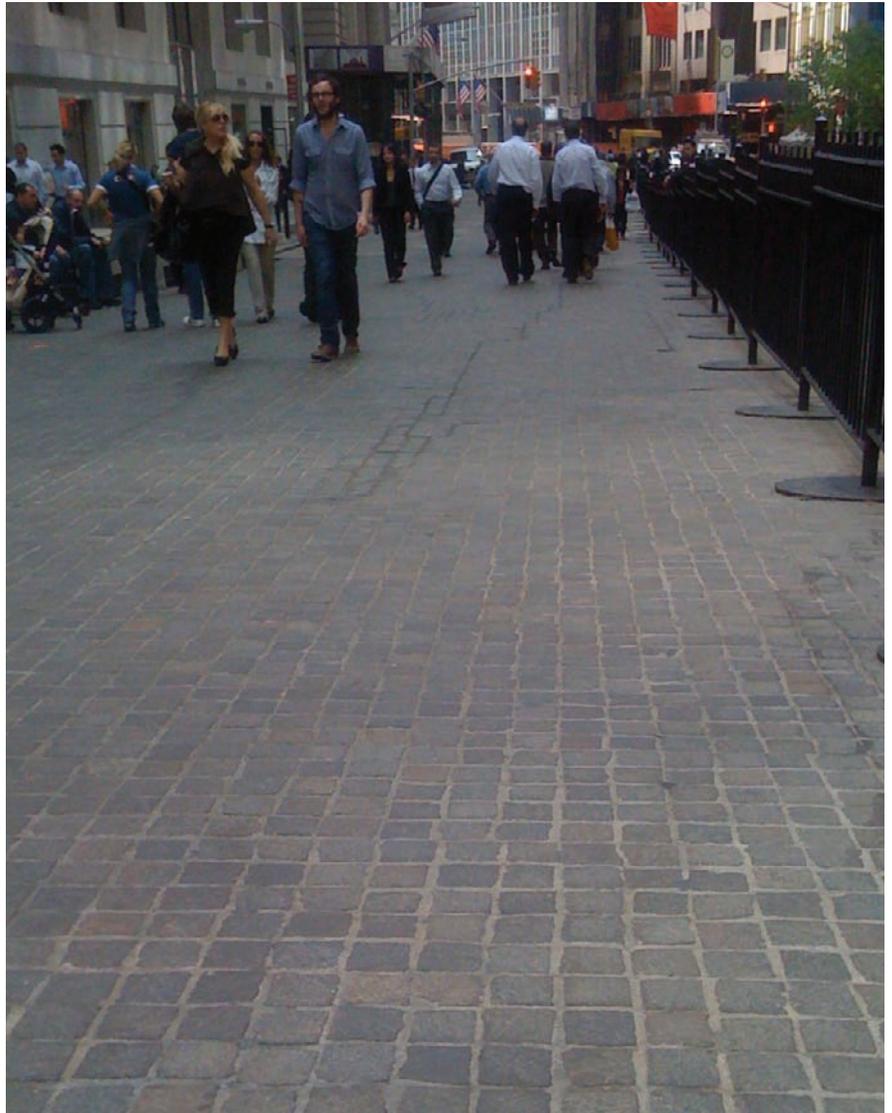
### Sustainability Opportunities

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.



*Modular cobblestone pedestrian street: Broad Street at Wall Street, Manhattan*

### 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

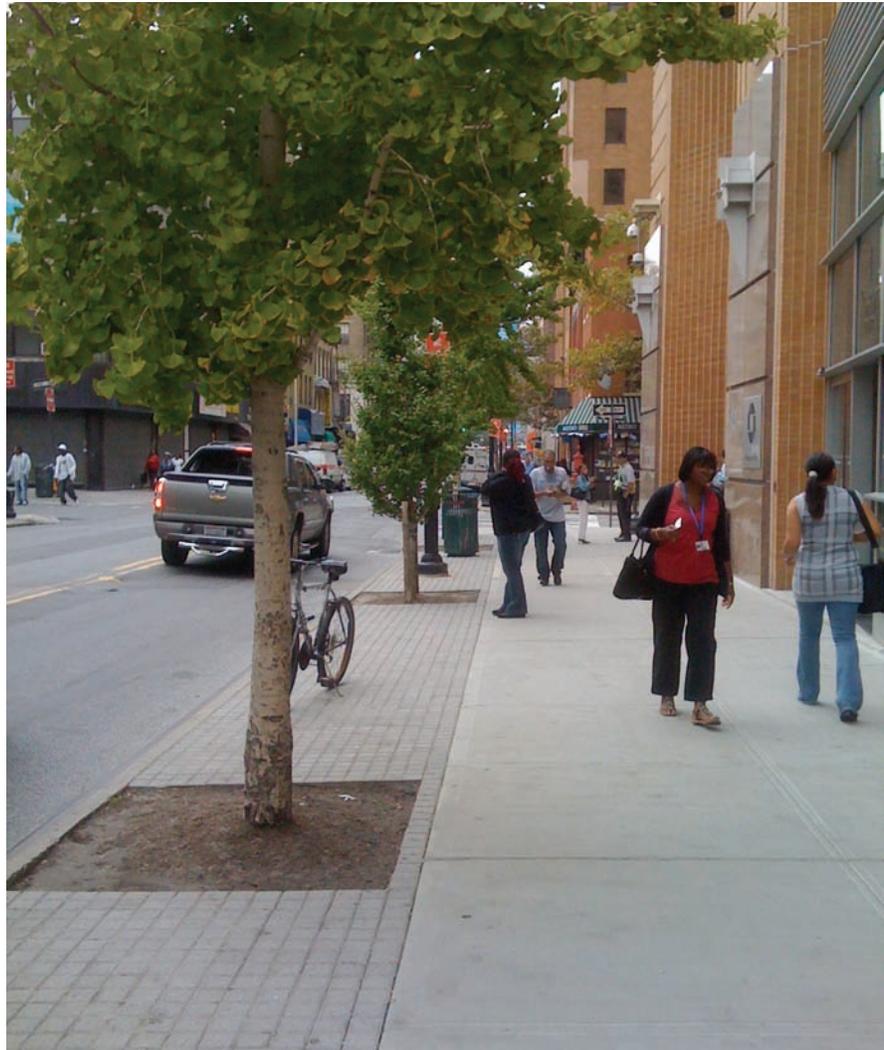
Various colors and styles available

Specification source: NYC DOT Standard Specifications section 6.06 A

## Square Asphalt or Concrete Pavers

USAGE: OPTIONAL

Precast square-shaped asphalt pavers.



Square asphalt pavers in a furnishing zone: Willoughby Street at Duffield Street, Brooklyn

### 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

## 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.



Poured, cast-in-place concrete with exposed glass aggregate: Brooklyn Plaza, Brooklyn

### 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

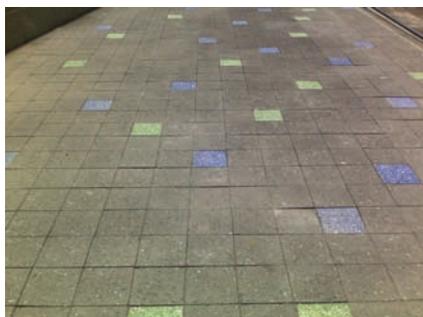
Specification source: NYC DOT Standard Specifications sections 4.13 EG, item numbers 4.13 EGA (for four-inch sidewalks), 4.13 EGB (for seven-inch sidewalks), 6.47 EGA8 (for pavers)

### Sustainability Opportunities

Supplementary cementitious materials (SCM)

High SRI value coloring

Recycled glass or reclaimed aggregates



Concrete pavers with exposed blue and green glass aggregate (shown interspersed with black asphalt pavers): Hudson River Park, Manhattan

# 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.



Typical concrete curb: Beach 73rd Street, Queens



Typical untinted concrete curb with steel facing: West 114th Street and Morningside Avenue, Manhattan

### 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 2.1.3, 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

## 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.



Typical tinted concrete curb with steel facing: Beaver Street at Hanover Street, Manhattan

### 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.



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

### 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

**Use of this material may require a maintenance agreement**

### 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

## Granite

### USAGE: OPTIONAL/HISTORIC

Granite cut to long sections and laid as curbing. Saw-finish, 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.



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

### 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

# 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.



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



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

### 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

## Hexagonal Concrete Pavers

USAGE: OPTIONAL

Concrete precast into hexagonally shaped pavers.



Hexagonal concrete pavers in a privately owned plaza: White Street at Broadway, Manhattan

### 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

Specification source: NYC DOT Standard Specifications 6.4.7 ER

### 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.



Decorative gravel seating area: Bryant Park, Manhattan

### 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

Specification source: NYC DOT Standard Specifications section 6.04DG

### Sustainability Opportunities

Permeable installation

Reclaimed gravel

## 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.



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

### 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

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

