Chapter 4: Parking Lot Design

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Chapter 4
Parking Lot Design

GENERAL CONSIDERATIONS

The parking lot is often the first, as well as the last, experience that a user has of a building complex. It is the gateway through which all customers, visitors, and employees pass. This first impression is very important to the overall feeling and atmosphere conveyed to the user.

Developers want their new facilities to be attractive, well designed, and functional. Though many hours are spent producing aesthetically pleasing building designs, the same design consideration for the parking area is often overlooked. Parking areas with pavements that are initially underdesigned can experience excessive maintenance problems and a shortened service life, and ultimately have a negative impact on the user’s experience of the building itself.

When properly designed and constructed, parking areas can be an attractive part of the overall facility, an integral element that is safe, and functional to the maximum degree. In addition, parking areas should be designed for low maintenance costs and easy modification when use patterns change.

The information in this chapter provides a general guide to proper parking area design, construction, and facility layout. Minimum pavement thickness designs are given for parking lots with various subgrade soil and traffic loading conditions. The Design Tables in this Chapter are based on the information presented in Chapter 3 of this Design Guide. In addition, this chapter gives comparable designs for both Full Depth asphalt pavements and asphalt pavements with untreated aggregate base.
General Planning
In developing the parking area plan, several important details should be considered. First and foremost in the mind of the developer may be providing maximum parking capacity while ensuring convenience and safety.

If the locality does not have a zoning ordinance identifying specific requirements for off-street parking, the general recommendations in Table 4-1 may be useful.

(Caution – Check Local Zoning Ordinances before proceeding.)

Table 4-1: Recommended Parking Requirements

<table>
<thead>
<tr>
<th>LAND USE</th>
<th>SPACES/UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td></td>
</tr>
<tr>
<td>Single-Family</td>
<td>2.0/Dwelling</td>
</tr>
<tr>
<td>Multifamily Efficiency</td>
<td>1.0/Dwelling</td>
</tr>
<tr>
<td>1-2 Bedroom</td>
<td>1.5/Dwelling</td>
</tr>
<tr>
<td>Larger</td>
<td>2.0/Dwelling</td>
</tr>
<tr>
<td>Hospital</td>
<td>1.2/Bed</td>
</tr>
<tr>
<td>Auditorium/Theater/Stadium</td>
<td>0.3/Seat</td>
</tr>
<tr>
<td>Restaurant</td>
<td>0.3/Seat</td>
</tr>
<tr>
<td>Industrial</td>
<td>0.6/Employee</td>
</tr>
<tr>
<td>Church</td>
<td>0.3/Seat</td>
</tr>
<tr>
<td>College/University</td>
<td>0.5/Student</td>
</tr>
<tr>
<td>Retail</td>
<td>4.0/1000 GFA</td>
</tr>
<tr>
<td>Office</td>
<td>3.3/1000 GFA</td>
</tr>
<tr>
<td>Shopping Center</td>
<td>5.5/1000 GLA</td>
</tr>
<tr>
<td>Hotels/Motel</td>
<td>1.0/Room</td>
</tr>
<tr>
<td>0.5/Employee</td>
<td></td>
</tr>
<tr>
<td>Senior High Schools</td>
<td>0.2/Student</td>
</tr>
<tr>
<td>1.0/Staff</td>
<td></td>
</tr>
<tr>
<td>Other Schools</td>
<td>1.0/Classroom</td>
</tr>
</tbody>
</table>

GFA, sq. ft. of gross floor area
GLA, sq. ft. of gross leasable area
Rules have been developed for optimizing parking area space. Among them are the following:

1. Use rectangular areas where possible.
2. Make the long sides of the parking areas parallel.
3. Design so that parking stalls are located along the lot’s perimeter.
4. Use traffic lanes that serve two rows of stalls.

Special attention should be given to the flow of traffic in and out of the lot as well as circulating routes inside the lot. Keep entrances far away from busy street intersections and from lines of vehicles stopped at a signal or stop sign. Be sure that the entering vehicles can move into the lot on an internal aisle, thereby avoiding congestion caused by involvement with turning vehicles. A pedestrian traffic-flow study is important to provide information about both safety and convenience.

**Parking Angle**

The most popular angles for parking stalls are 45°, 60°, and 90°. The most common angle for parking is the 60° angle because of the ease of operation it provides. This angle permits reasonable traffic lane widths and eases entry and exit of the parking stall.

Where lot size restricts the dimensions available for aisles and stalls, a 45° angle may be used. The smaller change of direction required to enter and back-out of the stall space permits use of narrower aisles. The 45° angle reduces the total number of parking spaces for a given area but is the only acceptable angle for a herringbone parking lot pattern.

The 90° parking angle provides the most parking spaces for a given area. The high degree of difficulty for entering and leaving these parking stalls makes this type of parking more suited to all-day parking, such as employee parking. This angle is generally not preferred for “in and out” lots such as those of fast food restaurants and banks.
Parking Space Dimensions

Typical parking stall dimensions vary with the angle at which the stall is arranged in relation to the aisle. Stall widths (measured perpendicular to the vehicle when parked) range from 8 1/2 to 9 1/2 feet. The minimum width for public use parking spaces is 9 feet by 19 feet. Recommended stall dimensions for compacts and similar-sized vehicles are 7 1/2 feet by 15 feet. If a number of such spaces are to be provided, they should be grouped together in a prime area to promote their use. Stall widths for parking lots where shoppers generally have large packages, such as supermarkets and other similar parking facilities, should be 9 1/2 feet or even 10 feet wide.

Table 4-2: Parking Layout Dimensions (in feet) for 9 Foot Stalls at Various Angles

<table>
<thead>
<tr>
<th>STALL LAYOUT ELEMENTS</th>
<th>ON DIAGRAM</th>
<th>45°</th>
<th>60°</th>
<th>75°</th>
<th>90°</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stall width parallel to aisle</td>
<td>A</td>
<td>12.7</td>
<td>10.4</td>
<td>9.3</td>
<td>9</td>
</tr>
<tr>
<td>Stall length of line</td>
<td>B</td>
<td>25</td>
<td>22</td>
<td>20</td>
<td>18.5</td>
</tr>
<tr>
<td>Stall depth to wall</td>
<td>C</td>
<td>17.5</td>
<td>19</td>
<td>19.5</td>
<td>18.5</td>
</tr>
<tr>
<td>Aisle width between stall lines</td>
<td>D</td>
<td>12</td>
<td>16</td>
<td>23</td>
<td>26</td>
</tr>
<tr>
<td>Stall depth, interlock</td>
<td>E</td>
<td>15.3</td>
<td>17.5</td>
<td>18.8</td>
<td>18.5</td>
</tr>
<tr>
<td>Module, wall to interlock</td>
<td>F</td>
<td>44.8</td>
<td>52.5</td>
<td>61.3</td>
<td>63</td>
</tr>
<tr>
<td>Module, interlocking</td>
<td>G</td>
<td>42.6</td>
<td>51</td>
<td>61</td>
<td>63</td>
</tr>
<tr>
<td>Module, interlock to curb face</td>
<td>H</td>
<td>42.8</td>
<td>50.2</td>
<td>58.8</td>
<td>60.5</td>
</tr>
<tr>
<td>Bumper overhang (typical)</td>
<td>I</td>
<td>2</td>
<td>2.3</td>
<td>2.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Offset</td>
<td>J</td>
<td>6.3</td>
<td>2.7</td>
<td>0.5</td>
<td>0</td>
</tr>
<tr>
<td>Setback</td>
<td>K</td>
<td>11</td>
<td>8.3</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Cross aisle, one-way</td>
<td>L</td>
<td>14</td>
<td>14</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Cross aisle, two-way</td>
<td>M</td>
<td>24</td>
<td>24</td>
<td>24</td>
<td>24</td>
</tr>
</tbody>
</table>

Parking Lot Markings

Markings are a very important element of a good parking lot. The parking area should be clearly marked to designate parking spaces and to direct traffic flow. As specified in the Manual on Uniform Traffic Control Devices (MUTCD), parking on public streets should be marked out by using white traffic paint, except for dangerous areas, which should be marked in yellow. Yellow lines are also commonly used in off-street parking lots. All pavement striping should be 4 inches in width.

New asphalt surfaces can be marked with either traffic paint or cold-applied marking tape. For best results with paint application, allow the asphalt pavement to cure for several days.
**Construction Practices**

**Drainage Provisions**

Drainage problems are frequently a major cause of parking area pavement failures. It is critical to keep water away from the subgrade soil. If the subgrade becomes saturated, it will lose strength and stability, making the overlying pavement structure susceptible to breakup under imposed loads.

Drainage provisions must be carefully designed and should be installed early in the construction process. Parking area surfaces should have a minimum slope of 2 percent (2’ per 100’). They should be constructed so water does not accumulate at the pavement edge. An underdrain system may be required to carry water away from the pavement structure.

If a compacted aggregate base is proposed, place it on the prepared subgrade and compact it to ensure a hard, uniform and stable surface.

The use of asphalt pavement base (compared to use of aggregate base) will greatly reduce the potential for strength and stability problems related to water.

**Subgrade Preparations**

All underground utilities should be protected or relocated before grading. All topsoil should be removed. Laboratory tests are recommended to evaluate the load-supporting characteristics of the subgrade soil. However, designs are frequently selected after careful field evaluations based on experience and knowledge of local soil conditions.

The area to be paved should have all debris and vegetation removed. Grading and compaction of the area should be completed so as to eliminate yielding or pumping of the soil.

The subgrade should be compacted to a uniform density of 95 percent of the maximum density. This should be determined in accordance with standard density (Test Method AASHTO T-99). When finished, the graded subgrade should not deviate from the required grade and cross section by more than 1/2 inch in 10 feet.

Areas of the subgrade that are anticipated for asphalt paving may be tested for uniformity and adequacy of support by driving a loaded dump truck at a speed of 2 to 3 mph over the entire surface. Areas that show a deflection of 2 or more inches should be further improved, such as with a compaction subcut or an additional thickness of asphalt pavement. When the improvement is completed, the finished grade should be hard, stable and constructed in reasonably close conformance with the lines, grades and proposed typical cross sections to allow for a working platform for paving construction equipment and associated activities. This process can be used to evaluate the stability of aggregate base, however, the deflection should be minimal.

**Asphalt Pavement Surface Course**

Material for the surface course should be placed in one or more lifts to the true lines and grade as shown on the plans. The asphalt surface should not vary from established grade by more than 1/4 inch in 10 feet when measured in any direction. Any irregularities in the surface of the pavement course should be corrected directly behind the paver. As soon as the material can be compacted without displacement, rolling and compaction should start and should continue until the surface is thoroughly compacted and roller marks disappear.
THICKNESS DESIGN FOR PARKING LOTS

Design thicknesses given in this section are minimum values calculated on the volume and type of traffic that are estimated to use the facility and on the assumed load-supporting capability of the underlying soils. For additional soil class information, refer to Chapter 3 of this Design Guide.

Special truck lanes are sometimes required to expedite traffic to loading areas, trash dumpster sites, and equipment areas. Design thicknesses for these lanes or pavement areas should be increased to accommodate the heavier vehicles they are anticipated to bear. Drainage problems are also a major cause of pavement failures. Their significance warrants a special section on drainage that should be reviewed before selecting a pavement design either from this guide or from any other source.

Design Procedure
Tables 4-3 and 4-4 can be used directly to select design thicknesses for a number of design input factors. To use the tables, appropriate traffic and subgrade classes must be selected as follows.

Design Steps
The following steps can be used to determine pavement thickness for parking lots.

1. Using the number of parking spaces to be marked, select the traffic class to be used.
2. Using soil data from the project, select a subgrade class (good, moderate, or poor as discussed in Chapter 3). (If the Test values for the soil lie between the values given, use the lower classification.)
3. Using the selected traffic class and subgrade class, select a design thickness from Tables 4-3 and 4-4.

Design Example
A new department store wishes to place a 350-car parking lot in front of their building. A truck loading zone and dumpster site will be placed in back. The Lower traffic level should be selected for the parking area and the Intermediate level for the Service Drives and other areas of Heavier Loading.

Soil data are known, indicating that the poor soil classification should be selected.

The total full-depth asphalt design thickness selected from Table 4-3 for the parking lot is 7 inches; the base/binder course is 5 inches, and the surface course is 2 inches. The total full-depth asphalt design thickness selected from Table 4-3 for the truck loading zone and approaches is 9 inches; the base/binder course is 7 inches and the surface course is 2 inches.
Pavement Thickness Tables
The pavement thickness for parking lots should be in accordance with the following tables, which have been developed by MAPA for use when designing small parking lots and driveways. Thicknesses shown were determined using the MnDOT Design procedures after estimates of soil condition and traffic loadings were made. The procedures outlined by MnDOT (as described in Chapter 3) should be used for unusual soil conditions or traffic loadings.

Heavily-Loaded Areas
The pavement for entrances, frontage roads, trash dumpster sites, and delivery truck parking, as well as the approach areas to these spaces, must be increased in thickness to prevent pavement failure caused by the weight and dynamic loading of vehicles. These areas should be constructed with a thickness that will support this special type of loading. Failure to provide this strengthening can result in severe pavement failure.

Table 4-3: Design Chart for Full-Depth Asphalt Pavements (AP) Thickness Required – Inches

<table>
<thead>
<tr>
<th>SUBGRADE SOIL</th>
<th>TRAFFIC LOADING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CAR LOTS &amp; DRIVEWAYS</td>
</tr>
<tr>
<td></td>
<td>AP WEAR</td>
</tr>
<tr>
<td>GOOD (R&gt;50)</td>
<td>2”</td>
</tr>
<tr>
<td>MODERATE (R=15 to 50)</td>
<td>2”</td>
</tr>
<tr>
<td>POOR (R&lt;15)</td>
<td>2”</td>
</tr>
</tbody>
</table>

(1) Less than 100 Trucks per Day.
(2) More than 100 Trucks per Day.

Table 4-4: Design Chart for Asphalt Pavements (AP) with Aggregate Base Thickness Required – Inches

<table>
<thead>
<tr>
<th>SUBGRADE SOIL</th>
<th>TRAFFIC LOADING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CAR LOTS &amp; DRIVEWAYS</td>
</tr>
<tr>
<td></td>
<td>AP WEAR</td>
</tr>
<tr>
<td>GOOD (R&gt;50)</td>
<td>2”</td>
</tr>
<tr>
<td>MODERATE (R=15 to 50)</td>
<td>2”</td>
</tr>
<tr>
<td>POOR (R&lt;15)</td>
<td>2”</td>
</tr>
</tbody>
</table>

(1) Less than 100 Trucks per Day.
(2) More than 100 Trucks per Day.

The Design Thickness required for a particular soil type and traffic loading will vary depending on whether Table 4-3 or Table 4-4 is used. Table 4-3 is based on MnDOT’s Full-Depth design, while Table 4-4 is based on MnDOT’s Bituminous Pavement Design Chart (Aggregate Base).
PLANNED STAGE CONSTRUCTION

Planned stage construction is a means of providing fully adequate pavements while effectively using funds, materials, and energy. As defined, it is the construction of an asphalt pavement parking lot or roadway in two or more stages, separated by a predetermined interval of time. In many situations, building pavements in stages makes good economic sense. It is a technique long used by city and county highway engineers.

Stage construction is not maintenance. It is the placement of a minimum depth of pavement during initial construction, and a final surface course placed at a planned future date. Asphalt pavement lends itself to this kind of construction.

Stage construction has the advantage of providing a thoroughly adequate, all-weather pavement for the initial development of an area. Any damage to the Stage 1 pavement caused by traffic, settlement, or utility tearups can be repaired prior to placement of the final surface. With a proper cleaning and an asphalt tack coat, the Stage 2 pavement bonds to the old surface and becomes an integral part of the entire pavement structure.

Caution: A pavement constructed by the stage construction process does not reach full load-carrying capacity until after the final stage has been completed. Because of this fact, isolated areas of distress are possible, which will require repair before the final stage is completed.

MISCELLANEOUS ASPHALT PAVEMENT CONSTRUCTION

Asphalt Pavement Gutter

An asphalt pavement gutter has many applications. This is especially true on rural roads that are hilly and in areas where soils are highly erodible. An asphalt pavement gutter offers a method of carrying the water in a manner similar to a curb, yet is much easier to plow in the winter. This is true because rather than a curb rising up to provide a barrier to the plow the gutter profile is below the level of the asphalt pavement.

Asphalt pavement gutters provide a solution to the erosion problem by carrying the water to the bottom of hills and then harmlessly discharging it into a ditch. A spillway must be constructed at the bottom of the hill, or at some predetermined midpoint, to carry the water from the gutter to the bottom of the ditch or pond. While the gutter is not capable of carrying all of the water all of the time (for example, during heavy storms), it does so most of the time, allowing vegetation to be established and eliminating many erosion problems.
The asphalt pavement gutter is constructed by first grading the entire roadbed in preparation for the paving. Immediately prior to the actual paving a notch is cut along the proposed edge of the new driving lane. The notch should be at least 2 inches below the surface of the aggregate base of the actual driving lane. The notch can be cut with a motor grader. Excess material generated can be left outside of the outside edge of the new gutter. This material can later be pulled back against the outside of the gutter as backfill. If the gutter is to be backfilled with topsoil, this material must either be left low or wasted on the outer slope. While the typical section shows a round bottom in the notch prior to paving, a square notch will work; however, a square notch will use more asphalt pavement than a round-shaped notch. Typically the equivalent of 3 inches of asphalt pavement should be calculated into the proposed yield for the gutter on a 2 or 2.5 inch surface.

Special care needs to be taken to insure the design of the paver-attached shoe provides the final shape of the gutter since it will not receive any further compaction. The gutter shoe must be attached to the paver on the end of the screed. The shoe should be designed to provide at least a 4-inch screed surface to provide uniformity and compaction. The shoe will need to be heated to provide a tight, smooth surface to the finished gutter.

If the gutter must be crossed to provide access to properties, care must be taken to adequately backfill the gutter with aggregate or, even better, with an apron of asphalt pavement to provide support to the backside of the gutter.

If an existing asphalt pavement roadway has an erosion problem next to the driving surface causing damage to the edge of the pavement, a gutter may be constructed in a similar manner using a shouldering machine rather than a paver. A shoe like that attached to the paver can be constructed and attached to the shouldering machine below the cutting edge of the wing. The preparation work for this type of construction is the same as the procedure for the paver application.
ASPHALT PAVEMENT MAT-PLATFORM FOR BUILDING CONSTRUCTION AND SITE PAVING

Site paving is the recommended first step in many types of building construction projects. It offers several advantages, providing a working mat or platform for shopping centers, schools, manufacturing concerns, warehouses, and similar facilities.

In this technique, an asphalt pavement base course is constructed on a prepared subgrade over the entire area that will become parking areas, service roadways, and buildings. When building construction is completed, a final asphalt pavement surface course is placed on the asphalt pavement base.

**Advantages**

Paving a building site before construction is completed has several benefits. These include the following:

1. It ensures constant accessibility and provides a firm platform upon which people and machines can operate efficiently, thereby speeding construction.
2. It provides a dry, mud-free area for construction offices, materials storage, and worker parking, eliminating dust control expenditures.
3. It eliminates the need for costly select material—the asphalt subfloor ensures a floor slab that is dry and waterproof.
4. Steel-erection costs can be reduced because a smooth, unyielding surface results in greater mobility for cranes and hoists.
5. The engineer can set nails in the asphalt pavement as vertical- and horizontal-control points, effectively avoiding the risk of loss or disturbance of this necessary survey work.
6. Excavation for footings and foundations and trenching for grade beams can be accomplished without regard for the asphalt base.

**Construction Practices**

*Subgrade Preparation*

All vegetation (including root systems), rocks, debris, and topsoil should be removed from the area being paved, drainage and utility facilities are installed, then backfill and compact. Adjustments in utilities or underground facilities can be readily accomplished through the asphalt base should changes occur.

The subgrade must be properly shaped to meet true lines and elevations. It must be compacted to not less than 95 percent of maximum laboratory density (AASHTO T-99). The surface of the compacted subgrade must not deviate by more than 3/4 inch from the established grade. A minimum slope of about 2 percent (2’ per 100’) should be maintained to provide adequate drainage of surface water from the finished pavement.

Areas of the subgrade that are anticipated for asphalt paving may be tested for uniformity and adequacy of support by driving a loaded dump truck at a speed of 2 to 3 mph over the entire surface. Areas that show a deflection of 2 or more inches should be further improved, such as with a compaction subcut or an additional thickness of asphalt pavement. When the improvement is completed, the finished grade should be hard, stable and constructed in reasonably close conformance with the lines, grades and proposed typical cross sections to allow for a working
platform for paving construction equipment and associated activities. This process can be used to evaluate the stability of aggregate base, however, the deflection should be minimal.

Base-Platform Construction

Asphalt pavement base material must be placed on the prepared subgrade. A base of 4 inches or less in depth should be placed in one lift. A base of a total thickness of more than 4 inches may be placed in two or more lifts with the bottom lift being a minimum of 3 inches. The material must be spread and compacted to the required thickness and density as specified and in the grades and dimensions shown on the plans. The surface of the base should not deviate more than 1/2 inch when measured with a 10-foot straight edge.

Surface Course Construction

After building construction is essentially completed, and all building materials and offices have been removed from the previously paved base, preparation for placement of the final surface course of asphalt pavement can begin. Should building operations or winter weather delay placement of the final surface, the asphalt pavement base will adequately serve traffic needs during the interim.

Preparation for the surface course requires thorough cleaning and sometimes washing of the asphalt base to remove tracked-on dirt and foreign particles. After cleaning, any cracked or broken areas in the base should be removed, replaced with asphalt pavement mix, and thoroughly compacted. All manholes, valve boxes, and other pavement fixtures should be brought to finished grade.

The asphalt pavement surface course consists of one or more layers placed on the previously constructed base course. The material must be spread and compacted to the required thickness and in the grades and dimensions shown on the plans. The finished surface should not deviate more than 1/4 inch when measured with a 10-foot straight edge.

Tack Coat

A tack or bond coat must be applied at the rate of 0.02 to 0.05 gallons per square yard between each course. The surface must be cleaned of all dust, dirt, or other loose material before the bond coat is applied. If emulsion is used, it should be diluted with equal parts of water or as specified in the proposal.
Porous Asphalt Pavement

The concept of managing storm water with porous or dense graded asphalt pavement has been done successfully in Minnesota since 2005, and nationally since the 1970’s. The pavement is engineered to allow water to infiltrate on-site and reduce storm water runoff while recharging the groundwater table. Asphalt pavements have been used in various climate conditions with the benefits of providing runoff control, aquifer recharge, reduction of drainage structures needed to comply with storm water regulations, and increased skid resistance and safety. The most common locations for use include parking lots and low volume roads or in high activity recreational areas like basketball and tennis courts or playground lots. Pavement design is also available for heavier load facilities.

As shown in Figure 1, a typical section consists of a porous asphalt pavement layer on top of a choker course layer, a reservoir course (designed for runoff detention frost penetration, and structural capacity), and a non-woven geotextile over the existing soil or subgrade material.

Figure 1 – Managing Storm Water with Asphalt Pavement

The proper design and application of storm water asphalt pavement design is important for successful use of the concept. Soil characteristics, local topography, and climate conditions are physical factors that will be used in the planning and design processes. Other considerations include traffic loading, use of the facility, and agency regulations (i.e. storm water regulations).

Special consideration is needed in the design relative to soil type, topography, and climate conditions. It is recommended that sites with a relatively deep water table be used. Areas with gentle sloping topography are ideal to allow the water to percolate through the system, although terracing the parking lot and using dense-graded asphalt pavement in steeper areas has worked successfully in hilly terrain. Several climate factors should be considered in the design including precipitation rate, depth of frost penetration, and excessive dust in the area. The design should be free of frost susceptible materials (depth as needed).
The typical depth of the asphalt pavement layer is 2 to 4-inches, depending upon the facility type. A porous asphalt layer contains little sand or dust, with an air void space of approximately 16 percent or more as compared to dense-graded asphalt pavements designed for two to four percent air voids. Note, a dense graded asphalt pavement could be used rather than porous asphalt layer, however it would require a piping system to distribute water in the reservoir layer. The choker course with ½" sized crushed rock is typically just enough to fill in some voids and lock the surface, thus creating a stable paving platform. The large-stone reservoir layer is the heart of the porous structure and is a crushed stone (between 1.5" and 3" in size) with a depth determined by the storage volume needed, structural capacity, or frost depth, whichever requires the greater thickness. A non-woven geotextile fabric can be placed between the large stone reservoir layer and the subgrade or in-place, uncompacted soil to prevent fines from migrating into the reservoir layer.

Porous asphalt pavements should be inspected several times in the first few months after construction, and annually thereafter. Inspections should be conducted after large storms to check for surface ponding that might indicate possible clogging. The surface can be vacuumed to assist in the maintenance of the pavement surface porosity. A liquid de-icer or fine salt should be used in place of sand, which will clog the system.

A draft guidance document for specifying porous asphalt pavements is available at MAPA’s web site. Also, the National Asphalt Pavement Association (NAPA) has guidance on porous asphalt pavements available on their web site.