ROADWAY CONSTRUCTION STANDARDS

1.1 INTRODUCTION

This policy is meant to establish guidance for roadways constructed within Spartanburg County. Outlined below are roadway section standards, requirements during construction, how newly constructed roadways and associated storm drainage are accepted into the County’s system for maintenance, and the responsibilities of the Developer after the County has accepted the infrastructure for maintenance.

Unless otherwise specified and/or approved by the County Engineer or his/her authorized representative all materials (structural fill, graded aggregate base courses, asphalt, storm drain, etc.) described within this policy and/or utilized for roadways constructed within Spartanburg County must meet the specifications outlined within the latest edition of the South Carolina Department of Transportation (SCDOT) Standard Specifications for Highway Construction.

1.2 ROADWAY DESIGN STANDARDS

Table 1. outlines standards that must be met for roadways constructed within Spartanburg County. As an alternative to Table 1., a site specific pavement design may be submitted by the Engineer of Record for the County’s consideration. A site specific pavement design must include the recommended pavement thickness for each road based on appropriate California Bearing Ratio (CBR) values (as dictated by the soil conditions at the site) and anticipated traffic volumes. If performed, the site specific pavement design must be submitted to the County Engineer or his/her authorized representative for review. Spartanburg County reserves the right to approve or deny any submitted site specific pavement design. Ultimately, a required pavement section is a function of subgrade conditions, traffic volume and loading. If, based on a 20 year AASHTO pavement design life, a structural number greater than 2.6 for residential or 3.6 for non-residential applications is required due to unusual subgrade conditions and/or anticipated traffic volumes/loads, Spartanburg County reserves the right to require a site specific pavement design be performed for either residential or non-residential applications.

Table 1. Roadway Section Standards

<table>
<thead>
<tr>
<th>Roadway Application</th>
<th>Full Depth Asphalt</th>
<th>Asphalt with Intermediate and Stone Base</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intermediate*** &amp; Initial Surface*</td>
<td>Final Surface</td>
</tr>
<tr>
<td>Residential (Public &amp; Private)</td>
<td>2.5&quot; 1.5&quot;</td>
<td>1.5&quot;</td>
</tr>
<tr>
<td>Option 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option 2</td>
<td>3.5&quot; N/A</td>
<td>2.5&quot; *</td>
</tr>
<tr>
<td>Non-Residential</td>
<td>6&quot; ** N/A</td>
<td>1.5&quot;</td>
</tr>
</tbody>
</table>

Notes: *
**Placed within 7 days of intermediate installation unless otherwise approved by County Engineer

**Must be installed in two lifts

***SCDOT Intermediate Type C
For residential applications, if Option 1, as listed in Table 1, is chosen, either 2.5 inches of intermediate and 1.5 inches of surface or 6 inches of stone base and 2 inches of intermediate shall be placed initially (unless otherwise approved by the County Engineer). After 80% of the lots are developed within a residential subdivision or 18 months has passed, (whichever comes first) the final surface of asphalt (1.5 inches) shall be placed. A bond, with surety and conditions satisfactory to it, providing for actual construction and installation shall be posted to ensure the final surface course will be installed.

a. The nature of the surety and procedures shall be as determined by the County to ensure that, in the event of default, sufficient funds will be available to install the final asphalt surface at no expense to Spartanburg County.

b. An Agreement and Surety Bond document will be executed for all bonded projects in an amount equal to at least 125% of the cost. The Surety may also be in the form of a letter of credit, reservation of funds, certified check, or other instrument readily convertible to cash in an amount equal to 125% of the cost.

c. Reduction of the bond amount may be accomplished upon the recommendation of the Department of Public Works based upon portions of the public improvements being adequately installed. Such reductions shall be in accordance with published standards for calculating such requests.

For residential applications, in order to apply the final surface course prior to the above requirement and to minimize construction traffic damage to the final surface, the thicker Option 2, as listed in Table 1, must be chosen.

1.3 CONSTRUCTION MATERIALS TESTING

Testing during construction shall include at least compaction/density testing and proof rolling of in-situ soils, roadway fill areas, utility trench backfill, and stone base courses. Other material testing may be required by the County Engineer or his/her authorized representative. The County Engineer or his/her authorized representative or third party Geotechnical Engineering firm registered within South Carolina must be on site for all proof rolls. Once performed, a proof roll is good for no more than 24 hours. Inclement weather (such as rain, snow, freeze/thaw, etc.) may reduce the useful life of a proof roll. If inclement weather and/or other unforeseen circumstances impact the structural integrity of the subgrade (soil and/or stone base) the County Engineer reserves the right to request additional proof rolls prior to stone base and/or asphalt installation.

1.3.1 Compaction/Density Testing Requirements
Compaction/density testing, by a third party Geotechnical Engineering firm registered within South Carolina, shall be performed on all fill material (included backfill for utilities) placed within the road's right-of-way. Furthermore, compaction/density testing, by a third party Geotechnical Engineering firm, shall be performed on all utility trench backfill (where the utility is to be conveyed to Spartanburg County for maintenance) that is located beyond the road's right-of-way. Structural fill shall be properly placed and compacted to a minimum of 95% Standard Proctor (ASTM D698/AASHTO T99) at +/- 2% optimum moisture with the upper two (2) feet beneath any pavement section compacted to a minimum of 98% Standard Proctor (ASTM D698/AASHTO T99) at +/- 2% optimum moisture. Additionally, any stone base utilized as a base course beneath a pavement section shall be compacted to a minimum of 98% Modified Proctor (ASTM D1557/AASHTO T160) at +/- 2% optimum moisture content.

1.3.2 Location/Frequency of Compaction Tests
Structural fill shall be placed and compacted in lifts. Compaction tests shall be performed at intervals of no more than 300 linear feet for fill (including utility trench backfill) placed outside of a roadway's limits and 150 linear feet for structural fill placed within the roadway's limits (including stone base if utilized). A compaction test shall be performed on every 12 inches of fill placed.
During construction, the Engineer of Record or Geotechnical Engineering firm shall determine the appropriate location and frequency of tests. Prior approval from the County Engineer or his/her authorized representative is required if the proposed testing frequency is less than outlined above.

1.4 SITE OBSERVATIONS/INSPECTIONS

Site observations/inspections shall consist of field visits during construction for the purpose of investigating present site conditions & activities, and documenting all substandard methods, materials, or conditions and their ultimate remediation. Inspections by the Engineer of Record and/or third party Geotechnical Engineering firm are required during the course of the project, and shall be conducted jointly with a County representative at critical stages of construction. A County inspection can be scheduled with 1 business day notice prior to inspections. Failure to provide this advance notice may result in scheduling conflicts, delay of the County’s inspection, and possible disruption of the project schedule.

1.4.1 Pre-Construction Meeting
At the direction of the County Engineer or his/her authorized representative, a pre-construction meeting (preferably on-site) will be required prior to work beginning. The Engineer of Record, Developer and/or Permitee, Geotechnical Engineering firm representative, Contractor, Utility Providers and County Engineer or his/her authorized representative are required to attend the meeting.

1.4.2 Clearing and Grubbing Operations
At the completion of clearing and grubbing activities and prior to any structural fill placement, the Engineer of Record and/or Geotechnical Engineering firm will perform a site visit to verify that all organic materials (i.e. stumps, logs, brush, topsoil, etc.) have been removed and the subgrade is suitable for structural fill placement (if required). The Engineer of Record and/or third party Geotechnical Engineering Firm must document any unsuitable soil conditions and their remediation.

1.4.3 Subgrade Compliance Verification
Prior to stone base and/or asphalt intermediate course installation, the Engineer of Record will check the road subgrade for proper elevations, grades, and crown, and will check the catch basin locations and configurations to identify any possible deviations from the plans. The Engineer of Record will also verify that all major utilities are installed and structural fill (including utility backfill) has been placed and properly compacted. The Engineer of Record will review all compaction test reports and verify the necessary number and location of tests and the required compaction has been achieved at each location. The Engineer of Record shall forward the results of all compaction tests and their verification to the County Engineer or his/her authorized representative for review. The County will be given at least three (3) business days to review the submitted compaction test results for the section of roadway to be paved prior to the request and/or performance of a proof roll of the roadway subgrade. The locations and elevations of all compaction tests shall be submitted with the test results. No roadway shall be paved until the County Engineer or his/her authorized representative has reviewed and approved the compaction test results for the section of roadway to be paved. Also, prior to stone base or intermediate installation, the County Engineer or his/her authorized representative will have the opportunity to perform an inspection of the storm drainage system. All lids and covers will be required to be removed for the inspection.

The County Engineer or his/her authorized representative shall meet the Engineer of Record and/or Geotechnical Engineering firm representative on-site to conduct a proof roll prior to intermediate or stone base installation. Necessary repairs shall be made based on the results of the proof roll. Additional proof rolls and/or compaction testing may be required to verify compliance.
1.4.4 Stone Base Installation (If Required)
During stone base installation, compaction testing by the third party Geotechnical Engineering firm as outlined above is required. The Engineer of Record will review all compaction test reports and verify the necessary number and location of tests and the required compaction has been achieved at each location. The Engineer of Record shall forward the results of all compaction tests and their verification to the County Engineer or his/her authorized representative for review. The County will be given at least three (3) business days to review the submitted compaction test results for the section of roadway to be paved prior to the request and/or performance of a proof roll of the stone base. The locations and elevations of all compaction tests shall be submitted with the test results. No roadway shall be paved until the County Engineer or his/her authorized representative has reviewed and approved the compaction test results for the section of roadway to be paved.

The County Engineer or his/her authorized representative shall meet the Engineer of Record and/or Geotechnical Engineering firm representative on-site to conduct a proof roll prior to intermediate installation. Necessary repairs shall be made based on the results of the proof roll. Additional proof rolls and/or compaction testing may be required to verify compliance.

1.4.5 Intermediate and Initial Surface Installation
During intermediate and initial surface installation (if Option 1 is utilized), the Engineer of Record and/or third party inspector certified as a SCDOT Asphalt Roadway Technician (ART) will monitor the paving application in order to provide direction and document the intermediate and/or initial surface course installation. Minimum observations during installation shall include temperature (both ambient and asphalt) and in-place asphalt thicknesses. Other material testing may be required by the County Engineer or his/her authorized representative. The County Engineer or his/her authorized representative will plan to be on-site, but the County's presence will not relieve the Engineer of Record or third party certified SCDOT ART inspector of his/her duty to document and certify proper installation.

1.4.6 Final Asphalt Surface Course Installation
The Engineer of Record and County Engineer or his/her authorized representative shall conduct a thorough punch-list inspection of the roadway, including curbs and catch basins, to identify base failures, broken curbs, broken CB aprons, etc. In the inspection report, the Engineer of Record will detail the items to be corrected and the tentative schedule for repair. After repair, the Engineer of Record shall meet the County Engineer or his/her authorized representative on-site to go over the repairs to the intermediate and/or initial surface (if Option 1 is utilized), curbs, and/or catch basins. Only after all repairs are satisfactorily complete can the final surface be installed.

During final surface installation, the Engineer of Record and/or third party inspector certified as a SCDOT ART will monitor the paving application to provide direction and document the final surface installation. Minimum observations shall include temperature (both ambient and asphalt) and in-place asphalt thickness. Other material testing may be required and requested by the County Engineer or his/her authorized representative. The County Engineer or his/her authorized representative will plan to be on-site, but the County's presence will not relieve the Engineer of Record or third party certified SCDOT ART inspector of his/her duty to document and certify proper installation of the final surface.

1.4.7 Final Punch-List Inspection
The Engineer of Record, Developer, Contractor, County Engineer or his/her authorized representative shall meet on the site to go over the project. In the inspection report, the Engineer of Record will detail the results of the meeting, any items to be corrected, and the tentative schedule for repair. If repairs are not substantially complete within 30 calendar days, a new punch list may be required and is at the discretion of the County Engineer or his/her authorized representative. The Engineer of Record will be expected to conduct follow-up or repeat
inspections as needed to resolve problems or provide the County with complete information and documentation as required above.

1.5 FINAL ACCEPTANCE OF ROADWAY BY SPARTANBURG COUNTY

At completion of all paving, storm drainage system installation, major utility installation, traffic and street sign/marking installation, curbing, and grassing/mulching of the right of way, the County Engineer or his/her authorized representative shall conduct an inspection with the Engineer of Record of the project to determine if the final punch-list items have been completed and the project is substantially complete. After which, the roads and associated storm drainage may be accepted into the County inventory for maintenance. The owner or developer initially shall install all required signage including but not limited to street identification signs, regulatory and warning signs, i.e., speed limit signs, and stop signs. Size, placement, and reflectivity shall conform to requirements of the most recent edition of the Manual on Uniform Traffic Control Devices, or otherwise approved by the County Engineer. Any approved non-typical street identification signs shall be maintained by the Homeowners Association. Any future replacement of street identification signs by Spartanburg County will be with County standard materials.

1.5.1 Record Drawings and Certification
Prior to acceptance of infrastructure into the County’s system for maintenance, record (or “as-built”) drawings (provided in an electronic format as required by the County) shall be submitted to the County. Also, a certification that the roadway’s design and construction is in compliance with this policy and project specifications is required prior to the County’s acceptance of infrastructure. Certifications are to be made by the Engineer of Record who shall be a registered professional engineer licensed in South Carolina.

1.5.2 Acceptance
If the County deems the project to be substantially complete and the County has received the documents outlined in Section 1.5.1, a written notice of acceptance by the County Engineer or his/her authorized representative will be issued.

1.5.3 One-Year Warranty
As a condition of the notice of acceptance, the Developer, either an individual, partnership, corporation, or other legal entity, will enter into an agreement with Spartanburg County wherein (s)he agrees that (s)he will repair, upon written notification by Spartanburg County and at his/her own expense, all defects in material and workmanship which occur in the roadways or drainage system accepted by Spartanburg County pursuant to the granting of such acceptance for a period of one year from the date such work is accepted by Spartanburg County. The one-year warranty period shall begin immediately after written notice of acceptance by Spartanburg County and shall cover all defects in materials, installation, and workmanship for the roadway pavement, storm drainage system, drainage outfall channels, curbs, grassing/erosion control and traffic and street signage/markings. Any significant problems, failures or defects observed during the warranty period shall be repaired by the developer at his/her expense, as deemed necessary by the County Engineer or his/her authorized representative.