

## ARTICLE XII

### CONSTRUCTION STANDARDS AND SPECIFICATIONS

1201. The purpose of this Section is to set forth construction standards for improvements related to subdivisions and land developments in South Middleton Township. Deviations and substitutions from these standards and specifications shall be permitted only if approved in advance by the Township Engineer.

1202. Streets - Streets shall be constructed in accordance with the following Table:

a. Street Construction Specifications Table 1201 a.

PAVEMENT ALTERNATIVE	COURSE	TYPE OF MATERIAL	ARTERIAL	COLLECTOR	LOCAL ROADS	RURAL ROADS	ALLEYS & SERVICE DRIVES
RIGID PAVEMENTS	WEARING	PORTLAND CEMENT CONCRETE	*	8"	6"	N/A	6"
	SUBBASE	PADOT #2A AGGREGATE	*	6"	6"	N/A	6"
	SHOULDERS		*	PADOT CONCRETE TYPE 2	PADOT PAVED TYPE 1I	N/A	PADOT PAVED TYPE 1I
FLEXIBLE PAVEMENTS	WEARING	PADOT ID-2	*	2"	1.5"	N/A	1.5"
	WEARING	PADOT FB-2	N/A	N/A	N/A	2"	N/A
	BINDER	PADOT ID-2	*	3"	3"	N/A	3"
	BINDER	PADOT BCBC	N/A	N/A	N/A	5"	N/A
	SUBBASE	PADOT #4 AGGREGATE (DUSTED)	*	8"	8"	N/A	N/A
	SUBBASE	PADOT #2A AGGREGATE	N/A	N/A	N/A	8"	8"
	SHOULDERS		*	4' - PADOT PAVED TYPE 1I	4' - PADOT PAVED TYPE 1I	2' - PADOT PAVED TYPE 1F	2' - PADOT PAVED TYPE 1I

- b. All components of street construction shall conform to the specifications set forth in the Pennsylvania Department of Transportation, Form 408 Specifications, 1996 as amended.
- c. The Township Engineer may approve an alternate paving specification provided that the alternate specification is the result of site-specific testing and geotechnical analysis performed by a professional geotechnical engineer, licensed in the Commonwealth of Pennsylvania.

- d. Section 310 of PENNDOT Publication 418, "Seldom Used Specifications", as attached at the end of this section, shall be incorporated herein and made part of the Subdivision and Land Development Ordinance.

### **SECTION 310 – CRUSHED AGGREGATE BASE COURSE**

310.1 DESCRIPTION – This work is construction of a stone or slag base course. When placed on sub-grade, it includes the preparation of sub-grade, as specified in Section 210.

310.2 MATERIAL –

- (a) COARSE AGGREGATE (FINE MATERIAL). Type A or Type B, No. 10, stone or slag, Section 704.2, except as follows:

Stone having unsatisfactory cementing qualities may be used, provided limestone fines in an amount of 20% are blended with the material.

Acceptable granulated blast furnace slag, meeting the gradation requirements for No. 10 aggregate may be used.

Granulated blast furnace slag, formed when molten iron slag is rapidly quenched in water, is acceptable providing it does not weigh more than 90 pounds per cubic foot (dry rodded unit weight, PTM No. 609). Slag material reasonably uniform and free from harmful amounts of clay, silt, vegetation, or other objectionable substances, is acceptable with a maximum size of 2 inches and not more than 20% passing the No. 100 sieve.

- (b) COARSE AGGREGATE (COARSE MATERIAL). Type A or Type B, No. 1 stone or slag, Section 703.2.
- (c) CALCIUM CHLORIDE. Section 721
- (d) WATER. Section 720.2

310.3 CONSTRUCTION – Construct using either Method 1 or Method 2.

- (a) EQUIPMENT

- 1. Spreaders. Use mechanical spreaders.

2. **COMPACTION EQUIPMENT.** Use rollers, as specified in Section 108.05(c)3.a. Use vibratory compaction equipment as required for Method 2.

(b) **GENERAL.** The following requirements are applicable to Method 1 and Method 2:

1. **SHOULDERS.** Either build up and compact shoulders for full width, to or above the elevation of each layer of base course, prior to placing base course; or build up and roll shoulders simultaneously with compaction of each layer.
2. **TEMPLATES, STRING LINES, AND STRAIGHT EDGES.** Use a template cut to the required cross section of the finished base course. Equip the template with metal or other vertical extensions attached to each end, so the bottom of the template will be at the elevation of the top of the base course. Furnish at least three templates. Test the cross section for surface irregularities at intervals of not more than 25 feet.

Use a 10-foot straightedge to test for longitudinal irregularities in the surface of the base course. Hold the straightedge parallel to the road centerline in contact with the surface. Move the straightedge from one side of the base course to the other. Advance along the base course in 5-foot increments.

3. **REPLACEMENT AREAS.** Areas will be marked where base course is required for existing pavement replacement. Remove pavement in these areas to neat lines, as specified in Section 203.
4. **MISCELLANEOUS.** In areas where spreading and compacting with mechanical equipment is impractical, spread and compact by another acceptable method.

If base course material is placed on existing pavement as an overlay or build-up, construct in compacted layers.

If sub-grade or sub-base material become mixed with the base course, remove the mixture; reshape and recompact the sub-grade and/or sub-base; reconstruct the unsatisfactory base course area.

Use calcium chloride only when and as directed.

5. INITIAL LAYER OF FINE MATERIAL. Spread an initial layer of fine material uniformly over the sub-grade, sub-base, or existing pavement as a bed and filler; spread to a depth of 2 inches on sub-grade, or 1 inch on sub-base or existing pavement.

Do not place this initial layer of fine material on wet, frozen, or unsuitable sub-grade or sub-base.

(c) METHOD 1. Use this method when compacting with rollers only.

If the base course is more than 8 inches in compacted depth, construct in two or more layers of approximately equal depth, with no layer less than 4 inches nor more than 8 inches in depth.

1. SPREADING COARSE MATERIAL. Spread uniformly on the initial layer of fine material to full width, unless otherwise specified. In areas inaccessible to spreading equipment, spread material directly from trucks, if permitted. Remove segregated material and replace with well-graded material. Do not spread the material more than the distance completed in an average day's work ahead of choking and compacting, as specified in Section 310.3(c)3 and (c)4, respectively.

Test each layer of material for surface irregularities, as specified in Section 310.3(b)2, and correct irregularities prior to rolling.

2. COMPACTING COARSE MATERIAL. On normal crown section, begin rolling at the sides and progress to the center. On super-elevated curves, begin on the low side and progress to the high side.

Install string lines with ample supports, offset along each side to control the elevation and depth of the base course. Maintain string lines until the base course is completed and the deficiencies have been corrected.

Roll parallel with the roadway centerline, uniformly lap each preceding track, cover the entire surface with the rear wheels, and continue until the material does not creep or wave ahead of the roller wheels.

Place red flags at the initial limits of compacted coarse material completed. The flags will be moved ahead as additional material is compacted. Do not apply filler to the coarse material outside of the flag-marked sections.

3. APPLICATION OF FINE MATERIAL. After thoroughly compacting coarse material, spread material uniformly over the surface with spreading equipment, to assure filling voids. In areas inaccessible to equipment, spreading with a square-edged shovel may be allowed; spread in a sweeping motion alternately in opposite directions, until the voids are filled. Do not end-dump the material directly on the surface of the coarse material. Immediately following the spreading, sweep and roll the material until remaining voids in the coarse material are filled and the base course is thoroughly compacted and set. Use brooms attached to the roller and hand brooms. Loosen and scatter excess fines formed in piles or cakes upon the surface.

Spread and roll the material in sections of not less than 150 feet nor more than 1,000 feet in length, unless otherwise directed.

Compact and bond each section, as specified in Section 310.3 (c)4, before beginning another.

4. COMPACTING AND BONDING. Begin rolling the sides and progress, as specified in Section 310.3(c)2. Cover the entire surface with the rear wheels, applying additional fines where necessary to fill voids, and continue rolling until the base course is thoroughly compacted and set.

After completion of spreading and rolling of fines, sprinkle with water and roll the surface of single-layer construction or roll the surface of each layer of multi-layer construction. Perform diagonal and cross-rolling, as required or directed. Continue the sprinkling and rolling, applying additional fines until voids are filled and a slight wave of grout forms in front of the roller wheels. Use roller-attached brooms and hand brooms to distribute the grout uniformly, filling the voids. Allow the rolled section to dry before proceeding with the surface course. Sprinkle and re-roll the surface on succeeding days, as required, to thoroughly bond and to provide a satisfactory base course. The Inspector-in-Charge will determine the quantity of fines and water required to produce a smooth, hard monolithic surface.

Sprinkle water, using acceptable methods.

- (d) METHOD 2. Use this method when compacting with rollers and vibratory equipment.

If the base course is more than 10 inches in compacted depth, construct in two or more layers of approximately equal depth, with no layer less than 5 inches nor more than 10 inches in depth.

1. SPREADING COARSE MATERIAL. Spread the coarse material, as specified in Section 310.3(c)1.
  2. COMPACTING COARSE MATERIAL. Immediately after making surface corrections to the coarse material, compact, using vibratory equipment. Roll the layer, as specified in Section 310.3(c)2.
  3. APPLICATION OF FINE MATERIAL. After the coarse material has been set and keyed by vibration and rolling, spread fine material uniformly over the surface in an amount equal to about one-half of that required to fill the voids in the coarse material. Operate the vibrator over the surface so the fines settle into the voids. Spread and vibrate the remaining fines in one or more applications to satisfactorily fill the voids; however, do not cause flotation of the coarse aggregate. Use manual methods to fill areas not completely filled by vibration.
  4. COMPACTING AND BONDING. After completing the vibration of the fine material, sprinkle the surface with water and roll. Continue the operation, as specified in Section 310.3(c)4.
- (e) SURFACE TOLERANCE. Test the finished base course for surface irregularities, as specified in Section 310.3(b)2.

Correct all surface irregularities exceeding ½-inch by loosening the surface and removing or adding material as required. Compact the corrected area and surrounding surface by rolling.

- (f) TESTS FOR DEPTH. Cut or dig one test hole to the full depth of the completed base course, where directed, for each 3,000 square yards or less.

The Engineer will measure the depth of the base course. The initial bed and filler layer of fine material is considered part of the base course for determining the final compacted depth.

Remove and replace any area in which the depth is deficient by ½-inch or more. Additional test holes may be required, if directed, to determine the limits of replacement areas.

After the depth has been measured, backfill test holes with acceptable material and compact.

- (g) MAINTENANCE AND TRAFFIC. Until placement of the surface course, maintain the completed base course, as specified in Section 901.3(b).

Maintain and protect base course opened to traffic by authority of the Engineer, as specified in Section 320.3(j).

Allow only necessary local traffic and essential construction equipment on the base course, unless otherwise directed. Repair or replace marred, distorted, or otherwise damaged pavement.

#### 310.4 MEASUREMENT AND PAYMENT –

- (a) CRUSHED AGGREGATE BASE COURSE. Square Yard or Ton

- (b) CALCIUM CHLORIDE. Ton

1203. Sidewalks – Sidewalks shall conform to the specifications set forth in the Pennsylvania Department of Transportation, Form 408 Specifications, 1998 as amended.

1204. Curbs and Gutters – Curbing and Gutters shall conform to the specifications set forth in the Pennsylvania Department of Transportation, Form 408 Specifications, 1998 as amended.

1205. Street Lighting – When required, street lighting shall conform to the specifications set forth in the Pennsylvania Department of Transportation, Form 408 Specifications, 1998 as amended.

#### 1206. Monuments and Markers

- a. Monuments must be set:
- (1) at the intersections of all street right-of-way lines.
  - (2) at the intersection of lines forming angles in the boundaries of the subdivision.

- (3) at one corner of a lot comprising a single lot subdivision, or at one predominant intersection of a street and a property line of a lot in a subdivision comprised of not more than 5 contiguous lots or parcels.
  - (4) at least three predominant line intersections or line angles in subdivisions of more than 5 lots or parcels, and in any land development program. When any program of development and/or subdivision encompasses more than 20 acres, the Township Supervisors and/or the Township Engineer may require additional monuments at designated points.
  - (5) such other points as may be required by the Township Engineer and Township Supervisors when unusual conditions may create sight problems or cause unusual deviation from normal surveying practice.
- b. Markers must be set:
- (1) at all corners except those monumented.
  - (2) by the time the property is offered for sale.
  - (3) at the beginning and ending of curves along street property lines if not monumented.
  - (4) at points where lot lines intersect curves either front or rear.
  - (5) at angles in property lines of lots.
  - (6) at all other lot corners.
- c. Monuments and markers shall be made of the following size and material:
- (1) Monuments shall be four (4") inches square or four (4") inches in diameter and shall be thirty (30") inches long. Monuments shall be made of concrete, stone or by setting a four (4") inch cast iron or steel pipe filled with concrete.
  - (2) Markers shall be three quarters (3/4") of an inch square or three quarters (3/4") of an inch in diameter and twenty-four (24") inches long. Markers shall be made of iron pipes or iron or steel bars.

- d. Monuments and markers must be placed so that the scored or marked point coincides exactly with the point of intersection of the lines being monumented. They must be set so that the top of the monument or marker is level with the finished grade of the surrounding ground. Monuments must be marked on top with a copper or brass plate or dowel set in the concrete.

#### 1207. Stormwater Management Construction Standards

Construction Standards for stormwater management and erosion control facilities shall be in accordance with the approved subdivision and/or land development plans and any accompanying specifications. The construction details and standards of the following publications in their most recent editions shall control:

- a. Handbook of Best Management Practices for Developing Watersheds, Pennsylvania Association of Conservation Districts, 1998, as amended.
- b. Erosion and Sediment pollution Control Handbook, PADEP.
- c. Pennsylvania Department of Transportation, Form 408 Specifications, 1998 as amended.
- d. Pennsylvania Department of Transportation, Highway Design Manual Part II, as amended.

#### 1208. Sanitary Sewerage Facilities

- a. The construction of all public sanitary sewer systems shall conform to the specifications, requirements, rules and regulations of the South Middleton Township Municipal Authority and the Pennsylvania Department of Environmental Protection as contained in the Domestic Wastewater Facilities Manual.
- b. The construction of any private sewerage systems shall conform to specifications contained in the Domestic Wastewater Facilities Manual, the Small Flow Sewage Treatment Facility Manual and/or Chapter 73 of the Pennsylvania Department of Environmental Protection Rules and Regulations.

## 1209. Public Water Supply Systems

- c. The construction of all public water supply systems shall conform to the specifications, requirements, rules and regulations of the South Middleton Township Municipal Authority and the Pennsylvania Department of Environmental Protection.
- d. The construction of any private water supply systems shall conform to Chapter 109 of the Pennsylvania Department of Environmental Protection Rules and Regulations.

## 1210. Landscaping Specifications

- a. All shrubbery and plants shall have a normal habitat of growth, and shall be sound, healthy, vigorous and free of disease, insects, insect eggs and larvae.
- b. All trees shall have a minimum trunk diameter of two and one-half (2.5) inches at a height of six (6) inches above finished grade.
- c. All plantings shall be performed in conformance with good nursery and landscape practices and to other standards that are established by the Township.
- d. Requirements for the measurement, branching, grading, quality and burlapping of all shrubbery shall follow the code of standards commended by the American Association of Nurserymen, Inc., in the American Standard Nursery Stock, ANSIZ60, 1-1973, as amended.
- e. Recommended Plant Materials

Species selection shall be based upon the existing site conditions including the site geology, hydrology, soils and microclimate, as well as functional considerations of screening, energy conservation and architectural compatibility.

- (1) The following is a recommended list of street trees for use in South Middleton Township. However, the Township may permit other planting types if they are hardy to the area, are not subject to blight or disease and are of the same general character and growth habitat as those listed below. Street trees shall have a minimum two and one-half (2.5") inch caliper.

- (a) *Acer rubrum* - Red Maple (hybrid varieties)
  - (b) *Fraxinus pennsylvanica* - Green Ash
  - (c) *Pyrus calleryana* "Aristocrat" - Aristocrat Pear
  - (d) *Pyrus calleryana* "Chanticleer" - Chanticleer Pear
  - (e) *Pyrus calleryana* "Redspire" - Redspire Pear
  - (f) *Quercus borealis* - Northern Red Oak
  - (g) *Quercus coccinea* - Scarlet Oak
  - (h) *Tilia Tomntosa* - Silver Linden
  - (i) *Tilia cordata* - Littleleaf Linden
  - (j) *Zelkova serrata* - Japanese Zelkova
- (2) The following is a recommended list of street trees for use within areas limited in space by overhead power lines and sidewalks:
- (a) *Acer campestre* - Hedge Maple
  - (b) *Crataegus crusgalli inermis* - Thornless Cockspur Hawthorne
  - (c) *Crataegus x Lavalleyi* - Lavalley Hawthorne
  - (d) *Koelreuteria paniculata* - Goldenrain Tree
  - (e) *Malus 'Centurion'* - 'Centurion' Crabapple
  - (f) *Malus 'Harvest Gold'* - 'Harvest Gold' Crabapple
  - (g) *Malus x zumi 'Calocarpa'* - Redbud Crabapple
- (3) Under no circumstances will any of the following trees be permitted to be planted as street trees:
- (a) Poplars - all varieties
  - (b) Willows - all varieties

- (c) White or Silver Maple (*Acer Saccharinum*)
- (d) Aspen - all varieties
- (e) Common Black Locust