

## PART II. TECHNICAL PROVISIONS

### DIVISION 5. ROADWAY, BASE AND PAVEMENT PLANS AND SPECIFICATIONS\*

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\***Editor's note:** Ord. No. 99-32, Art. I, adopted July 8, 1999, amended the Code by renumbering and amending former Div. 4, §§ 11-106--11-120 as a new Div. 5, §§ 11-120--11-134.

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#### **Sec. 11-120. Generally.**

The roadway, base, drainage, and pavement plans and specifications for proposed streets and roads or County roads shall equal the following minimum standards and be in accordance with the standards set forth in this Division. Any conditions or items not covered shall be [in] accordance with the current Arkansas Highway and Transportation Department's Standard Specifications.

(Ord. No. 91-9, Art. 1, § 4.01, 4-11-91; Ord. No. 99-32, Art. 1, 7-8-99)

#### **Sec. 11-121. Clearing and grubbing.**

(a) All trees, stumps, roots and other obstructions not designated to remain shall be cleared and/or grubbed in such a manner so as to not cause injury to other things designated to remain. Stump holes shall be filled with suitable material and compacted.

(b) If material is to be burned, it shall comply with all applicable laws and ordinances, and shall be under the constant care of competent watchmen.

(Ord. No. 91-9, Art. 1, § 4.02, 4-11-91; Ord. No. 99-32, Art. 1, 7-8-99)

#### **Sec. 11-122. Roadway excavation and embankment.**

(a) Suitable material shall consist of soil or a mixture of soil, stone or gravel. It shall be free of sod, logs, stumps, roots and other deleterious matter; and it shall be capable of forming a stable embankment when compacted.

(b) All suitable material obtained during the excavating operations shall be used in the construction of the roadway embankments and subgrade, and all unsuitable material shall be used behind the curb or hauled to an approved waste area.

(c) All roadway cuts and grades shall conform to those shown on the approved plans or approved plan changes.

(d) Sod and vegetable matter shall be removed from the surface upon which embankment of less than four (4) feet is to be placed.

(e) Roadway embankment shall be constructed in layers not to exceed eight (8) inches (loose measurement). Each layer shall be compacted at or near optimum moisture for that particular soil to at least ninety-five (95) percent of the maximum density, as determined by AASHTO T 99 (Standard Proctor).

(f) In areas where solid rock is encountered, it shall be excavated to a depth of eight (8) inches below subgrade elevation and replaced with approved material.

(g) Rock obtained during excavation operations may be placed in layers not exceeding thirty (30) inches. The rock shall be placed in a manner that the voids between the rock fragments are filled with suitable material. The top twelve (12) inches of the finished subgrade shall not contain rock over four (4) inches in its greatest dimension.

(h) Embankment which is adjacent to structures and inaccessible to normal compaction equipment shall be placed in four-inch (loose measurement) layers and compacted to at least ninety-five (95) percent of maximum density as obtained by AASHTO T 99. The material shall be compacted with mechanical equipment where it is inaccessible to the normal compaction equipment.

(Ord. No. 91-9, Art. 1, § 4.03, 4-11-91; Ord. No. 99-32, Art. 1, 7-8-99)

### **Sec. 11-123. Subgrade.**

(a) In fill sections where A-5, A-6, or A-7 soils are encountered which have an LL greater than 40 or a PI greater than 17, an upgraded embankment material should be used in the top two (2) feet of the subgrade; or the top six (6) inches of the subgrade treated with lime. In cut sections where A-5, A-6 or A-7 soils are encountered which have a LL greater than 40 or a PI greater than 17, the top (6) inches of the subgrade should be treated with lime. These requirements are in addition to the pavement section required based upon the soil type of the existing subgrade material.

(b) When lime treatment is required, the subgrade shall be finished to stringline grade prior to adding and mixing the lime. The depth of the lime treatment shall be checked at 500-foot intervals. The depth of the lime treatment shall be at least five and one-half (5 1/2) inches. If the depth is less than five and one-half (5 1/2) inches, the section represented by the test shall have additional lime added and the section reprocessed.

(c) The subgrade shall be prepared in such a manner to ensure a firm foundation that is stable and free from dust pockets, wheel ruts and other defects.

(d) The top eight (8) inches of the subgrade shall be compacted to a density, as determined by AASHTO T 191 or T 238, of not less than ninety-five (95) percent of the maximum density obtained by AASHTO T 99. This shall be accomplished by scarifying as necessary, shaping and compacting to the required grade and section at near optimum moisture content.

(e) The finished subgrade shall be stringlined within  $\pm$  3/4 inch of the finished grade and typical section shown on the approved plans.

(Ord. No. 91-9, Art. 1, § 4.04, 4-11-91; Ord. No. 99-32, Art. 1, 7-8-99)

### **Sec. 11-124. Curb and gutter.**

(a) The subgrade shall be shaped and compacted to the required grade and section as shown on the plans. All unsuitable material, including soft and yielding material, shall be removed and replaced with suitable material and compacted to the proper density.

(b) (1) For flexible pavements, the appropriate depth of base material shall be carried at least one (1) foot beyond the back of the curb for drainage. This requirement only applies when the total flexible pavement structure is ten (10) inches or more. This will require a minimum of four (4) inches of SB-2, SB-3, asphalt stabilized base, or cement treated base between the subgrade and the curb and gutter. In efforts not to produce a trench section, the base material should be daylighted where possible and feasible. If the flexible pavement structure is less than ten (10) inches it is not required to carry the base material under the curb and gutter. Figure II shows this detail.

(2) For concrete pavement, Figure II is modified to the following: The special subbase shall be carried at least one (1) foot beyond the back of the curb and gutter. The slope of the subgrade shall be maintained under the curb and gutter and for at least one (1) foot behind. Any buildup for the curb and gutter shall be with the special subbase. In efforts not to produce a trench section, the special subbase should be daylighted where possible and feasible.

(c) All utility lines, including service lines, shall be laid, backfilled and compacted with SB-2 or SB-3 base or other material suitable to the County Road Superintendent before the curb and gutter is constructed.

(d) Any service or utility line crossings not placed before the pavement and curb and gutter are constructed shall be installed by boring, and the procedures shall be approved by the County Road Superintendent. A permit and a cash deposit or bond shall be required. Cutting of the pavement will not be permitted except in extreme and unusual conditions. Such exceptions shall be approved by the County Road Superintendent in writing.

(e) All curb and gutter shall be constructed of Portland cement concrete in accordance with the dimensions in Figure II. The concrete shall meet the AHTD requirements for Class S(AE) air entrained concrete, and have a minimum twenty-eight-day compressive strength of four thousand (4,000) psi when tested in accordance with AASHTO T 23.

(f) Where flexible pavements are used, contraction joints shall be provided at twenty-five-foot intervals. Expansion joints shall be provided at all stationary structures, such as drop inlets and at curb returns. They are to be constructed at right angles to the curb line. Where rigid pavements are used, sawed joints shall be provided to match the

transverse joints in the concrete pavement and expansion joints shall be provided at stationary structures such as drop inlets and at curb returns.

(g) All contraction joints shall be constructed to the proper width and depth, cleaned, and the joint material installed in strict compliance with the manufacturer's recommendations.

(h) The contraction joint material shall meet the AHTD requirements for pavement joint material, and the supplier shall furnish a materials certification on the joint material.

(i) The expansion joint material shall have a thickness of one-half ( 1/2) inch and conform to AASHTO M 213.

(j) The curb and gutter shall be cured with a curing compound or wet burlap.

(k) If the subgrade, subbase or base is dry, it shall be wetted just prior to placing the concrete so the moisture will not be pulled from the concrete.

(l) After the concrete curb and gutter has set, the area behind the curb shall be partially backfilled before the base material is placed and compacted.

(m) Curb modifications for driveways shall be in accordance with the detail in Figure III. The driveway shall slope up to a minimum elevation at the roadway right-of-way equal to the height of the curb. As an alternate, the entire curb and gutter section for the driveway may be sawed vertically for the full depth and removed. The curb and gutter shall then be constructed as a part of the driveway. The modified curb and gutter must have the shape shown in Figure III, and have half-inch filled construction joints at each end of the driveway.

(n) Where sidewalks are required, to the extent possible, they shall be located at the right-of-way line and constructed within the right-of-way.

(o) The sidewalk material, width and depth shall be as follows:

(1) The concrete shall meet the AHTD requirements for Class A air entrained concrete, with a minimum twenty-eight-day compressive strength of three thousand (3,000) psi.

(2) In residential areas the sidewalks shall be four (4) feet wide and four (4) inches thick.

(3) In commercial and industrial areas the sidewalks shall be five (5) feet wide and four (4) inches thick, except in the areas of all driveways and ten (10) feet either side of the driveway limits, where the sidewalk thickness shall be increased to six (6) inches.

(p) At all roadway intersections and where necessary at driveways the curb and gutter and sidewalk shall be modified to accommodate the handicapped.

(Ord. No. 91-9, Art. 1, § 4.05, 4-11-91; Ord. No. 99-32, Art. 1, 7-8-99)

**Sec. 11-125. Crushed stone base course.**

(a) The base material shall consist of a mixture of crushed stone and natural fines, and shall have a percent loss by the Los Angeles Test (AASHTO T 96) not greater than forty-five (45). The material shall contain no more than five (5) percent, by weight, of deleterious. The crushed stone base material shall meet the following gradation requirements:

*Total Percent Retained by Weight*

TABLE INSET:

Size of Sieve	SB-2	SB-3
1"	0	0
3/4"	10--50	40--35
#4	50--75	50--75
#40	70--90	70--90
#200	90--97	90--97

(b) The fraction passing the No. 200 sieve shall not be greater than two-thirds ( 2/3) the fraction passing the No. 40 sieve. The fraction passing the No. 40 sieve shall have a LL not greater than 25 and a PI not greater than 6.

(c) The depth of the crushed stone base course shall be within  $\pm$  1/2 inch of the required depth shown in Table 1. The average of all depth measurements shall not be less than the required depth shown in Table 1, and any depth in excess of the + 1/2 inch shall not be used in computing the average depth.

(d) The base course shall be placed on an approved subgrade and spread uniformly in such a manner that no segregation of coarse and fine particles will occur. Under no circumstance shall the base course be placed on a frozen subgrade.

(e) The base course shall be constructed in layers not exceeding eight (8) inches of compacted depth at substantially optimum moisture. The contractor must be capable of compacting the material at this depth, otherwise the material be placed and compacted in layers. The density of the compacted material in each layer, as determined by AASHTO T 191 or T 238, shall not be less than ninety-eight (98) percent of the maximum density obtained in the laboratory.

The laboratory density shall be obtained as follows: the sample is prepared by removing the aggregate retained on the three-fourths-inch sieve and adding passing aggregate passing the three-fourths-inch sieve and retained on the No. 4 sieve in an amount equal to that removed. The sample so prepared shall be compacted in five (5) equal layers in a cylindrical mold six (6) inches in diameter and seven (7) inches high. Each layer shall be compacted by fifty-five (55) blows with a ten-pound, two-inch diameter hammer dropped at a height of eighteen (18) inches. Trial sample specimens shall be molded at various moisture contents. The oven dry weight per cubic foot of material at optimum moisture content is termed the maximum density.

(f) When stringlined, the surface shall be within  $\pm$  1/2 inch of the typical section shown in Appendix B.

(Ord. No. 91-9, Art. 1, § 4.06, 4-11-91; Ord. No. 99-32, Art. 1, 7-8-99)

### **Sec. 11-126. Cement treated crushed stone base.**

The cement treated crushed stone base shall meet the Arkansas State Highway Commission's Standard Specifications for Highway Construction, hereafter, referred to as the AHTD Standard Specification, requirements for cement treated crushed stone base course, with the following exceptions:

(1) The cement treated crushed stone base shall consist of aggregate meeting the requirements for SB-2 or SB-3, three (3) percent to six (6) percent by weight of Type I Portland cement, and water at  $\pm$  one (1) percent of optimum. The percent cement and water shall be determined from laboratory tests. The specimens of aggregate, cement and water must develop a compressive strength of at least 6y50 psi in seven (7) days. The type of asphalt used for protection and cover for the cement treated base will be at the option of the contractor, subject to the approval of the County Road Superintendent.

(2) The cement treated base shall not be mixed or placed while atmospheric temperature is below thirty-five (35) degrees Fahrenheit within twenty-four (24) hours, or when the weather is foggy or rain. During cold weather the cement treated base shall be protected for seven (7) days. When the temperature is expected to drop below thirty-five (35) degrees Fahrenheit, a sufficient supply of hay, straw, or other material suitable for cover and protecting the previously placed material shall be used. Any cement treated base which has been damaged by freezing, or otherwise, shall be removed and replaced at the contractor's expense.

(3) The crushed stone base, cement and water shall be mixed in a pugmill type central plant, a self-propelled or self-powered traveling mixer equipped with a rotor or other approved type mixer that will thoroughly mix the base and cement at the required depth and at or near the optimum moisture content, or by other methods approved by the County Road Superintendent.

(4) The cement treated crushed stone base shall be placed on an approved subgrade and spread uniformly in such a manner that no segregation of coarse and fine particles will occur. Under no circumstances shall the base course be placed on a frozen subgrade.

(5) The cement treated crushed stone base shall be constructed in layers not exceeding six (6) inches of compacted depth at substantially optimum moisture. The density of the cement treated crushed stone base, as determined by AASHTO T 191 or T 238, shall not be less than ninety-eight (98) percent of the maximum laboratory density obtained by the procedures described in section 11-111 for crushed stone base courses.

(6) After the cement treated base has been finished, it shall be protected from drying by the application of approximately two-tenths (0.2) gallon per square yard of bituminous material. The bituminous material shall be applied as soon as possible, but in no case later than twenty-four (24) hours and maintained for seven (7) days.

(7) No vehicles shall be allowed on the cement treated base during the seven-day curing period. Finished portions of cement treated base that are used by construction equipment shall be protected in such a manner to prevent equipment from marring or damaging the completed work. Any damage to the cement treated base resulting from vehicles shall be removed and replaced at the contractor's expense.

(8) The depth of the cement treated base shall be within  $\pm 1/2$  inch of the depth shown in Table 2, Appendix A. The average of all depth measurements shall not be less than the required depth shown in Table 2, Appendix A, and any depth in excess of the  $+ 1/2$  inch shall not be used in computing the average depth.

(9) When stringlined, the surface shall be within  $\pm 1/2$  inch of the typical section shown in Appendix B.

(Ord. No. 91-9, Art. 1, § 4.07, 4-11-91; Ord. No. 99-32, Art. 1, 7-8-99)

**Sec. 11-127. Special subbase.**

(a) Unless waived in writing by the County Road Superintendent, a special subbase shall be placed under all rigid pavements. The minimum thickness of the special subbase shall be two (2) inches unless the County Road Superintendent specifies a thicker depth. But in no case should the depth exceed four (4) inches.

(b) The special subbase shall be one (1) of the materials listed below.

(1) Coarse limestone screenings meeting the following gradation:

TABLE INSET:

Screen Size	Percent Retained
1/2"	0
#4	24-- 35
#10	78-- 88
#20	92--100
#40	94--100
#200	96--100

(2) Surface treatment aggregate meeting the AHTD Standard Specification requirements for Class 10 Mineral aggregate.

(3) Any other well draining material approved by the County Road Superintendent.

(4) If necessary, the special subbase shall be rolled with a light steel roller, but a specific density will not be required.

(Ord. No. 91-9, Art. 1, § 4.08, 4-11-91; Ord. No. 99-32, Art. 1, 7-8-99)

**Sec. 11-128. Prime and tack coats.**

The materials and workmanship for primes and tack coats shall be AHTD Standard Specification requirements for prime and tack coats, with emphasis on the following items:

- (1) The prime coat shall be a medium curing cut back or an asphalt penetrating prime. The tack coat shall be a rapid curing cut back or an emulsified asphalt. The type and application rate of each shall be determined by the engineer.
- (2) Care shall be taken to clean the surface to be tacked or primed of dust, dirt and loose or foreign materials prior to the application.
- (3) Prime coats shall not be placed when the surface temperature is below fifty (50) degrees Fahrenheit; nor shall it be applied to a surface having an excess of moisture, nor when the general weather conditions, in the opinion of the engineer, are not suitable.
- (4) If the prime coat becomes damaged before the surface course is placed, it shall be repaired at the contractor's expense.
- (5) The surface of all structures, such as curbs and bridge rails, shall be protected from the prime or tack coat.
- (6) If traffic is to use the prime coat before the surface is placed, it shall be covered with a blotter course consisting of clean sandy material or commercially processed sand or sand-size screenings.
- (7) Excess material shall be removed and then blotted.

(Ord. No. 91-9, Art. 1, § 4.09, 4-11-91; Ord. No. 99-32, Art. 1, 7-8-99)

**Sec. 11-129. Bituminous surface treatment.**

Bituminous surface treatments (chip seals) shall meet the AHTD Standard Specification requirements for bituminous surface treatment, with emphasis on the following items:

- (1) The aggregate shall meet the AHTD requirements.
- (2) The asphalt material and the application temperature shall meet the AHTD requirements for bituminous materials.
- (3) Bituminous surface treatments shall not be placed between the period of October 15 and April 15, nor when the surface temperature is below sixty (60) degrees Fahrenheit. Note the temperature requirement is on the surface and not air temperature. Bituminous surface treatments placed in the early spring or late fall when the ground has cooled, but the air temperature rises above sixty (60) degrees Fahrenheit, have a very poor success rate.
- (4) The surface shall be properly cleaned and all structures protected from the spray.
- (5) Each time the distributor begins an asphalt application, it shall be started on paper, such as wrapping paper, which can be removed leaving a good starting line and eliminate any overlap.
- (6) Unless approved by the County Road Superintendent, the equipment shall meet the AHTD requirements.
- (7) If an asphalt emulsion is used, it is very critical to have the aggregate loaded and ready to spread prior to applying the emulsion. The spreading of the aggregate should follow very closely behind the distributor.
- (8) The aggregate shall be rolled with a pneumatic tired roller before the asphalt has chilled or the emulsified asphalt breaks.
- (9) The surface shall be maintained for up to four (4) days, as directed by the engineer.
- (10) If a succeeding application is required, it shall follow the same construction procedures as the first. It shall not be placed until the preceding application has cured and the rock properly set.

(Ord. No. 91-9, Art. 1, § 4.10, 4-11-91; Ord. No. 99-32, Art. 1, 7-8-99)

**Sec. 11-130. Asphalt stabilized base course.**

Asphalt stabilized black base shall meet the AHTD Standard Specification requirements for hot mix asphalt stabilized base course, with the following exceptions:

- (1) The depth of the asphalt stabilized base shall be within  $\pm 1/2$  inch of the required depth shown in Table 2, Appendix A. The average of all depth measurements shall be not less than the required depth shown in Table 2, Appendix A, and any depth in excess of  $+ 1/2$  inch shall not be used in computing the average depth. When stringlined, the surface shall be within  $+ or - 1/2$  inch of the typical section shown in Appendix B.
- (2) The aggregate shall meet the requirements for SB-2 or SB-3 crushed stone base course.
- (3) The aggregate and asphalt shall be mixed in an approved drum or batch plant, and placed on an approved subgrade with a normal hot mix paver.
- (4) The mixture shall be rolled and compacted while hot to a minimum density of ninety-eight (98) percent of the maximum density as obtained by AHTD proctor design procedures.
- (5) Unless otherwise directed by the County Road Superintendent, a tack coat shall be used between succeeding asphalt layers. The tack shall meet the AHTD Standard Specification requirements for tack coat.
- (6) The supplier shall submit a materials certification containing the aggregate gradation, asphalt type and content, and the unit weight in pounds per cubic foot.

(Ord. No. 91-9, Art. 1, § 4.11, 4-11-91; Ord. No. 99-32, Art. 1, 7-8-99)

**Sec. 11-131. Asphalt hot mix binder and asphalt hot mix surface courses.**

The asphalt hot mix binder and surface courses shall meet the AHTD Standard Specifications for hot mix binder and surface courses with the following exceptions:

- (1) The depth of the asphalt hot mix binder course shall be within  $\pm 3/8$  inch of the required depth shown in Table 2, Appendix A. The average of all depth measurements shall be not less than the required depth shown in Table 2, Appendix A, and any depth in excess of  $+ 3/8$  inch shall not be used in computing the average depth.
- (2) The depth of the asphalt hot mix surface course shall be within  $\pm 1/4$  inch of the depth shown in Table 1, Appendix A, plus any additional depth required as a result of deficient depth(s) of binder and base material. The average of all depth

measurements shall be not less than the required depth, and any depth in excess of the + 1/4 inch shall not be used in computing the average depth.

(3) The crushed stone base course of cement treated crushed stone base course shall be primed. The prime coat shall meet the AHTD Standard Specification requirements for prime coat. The prime shall cure for at least seventy-two (72) hours, or as approved by the County Road Superintendent before placing any asphalt layer. EPR-1 can be substituted in lieu of MC-30. Curing time must be a minimum of two (2) hours.

(4) Unless otherwise directed by the County Road Superintendent, a tack coat shall be used between succeeding asphalt layers. The tack shall meet the AHTD Standard Specification requirements for tack coat.

(5) The binder course shall meet the AHTD gradation requirements for Type II binder course or Type II surface course.

(6) The surface course shall meet the AHTD gradation requirements for Type II or Type III surface course.

(7) The binder and surface course shall be designed with a minimum fifty-blow Marshall stability of one thousand (1,000) pounds; a flow of 8 to 16; and two (2) to five (5) percent air voids. A job mix formula shall be established and approved by the engineer for both the binder course and the surface course.

(8) The supplier shall submit a materials certification giving the stability, gradation, asphalt type and content, flow, voids, and maximum theoretical density of both the binder and surface course mixes used.

(9) Both binder course and surface course shall be compacted to a minimum of ninety-two (92) percent of maximum density as determined by the fifty-blow Marshall design procedures.

(10) If the nuclear gauge is used to determine density, it must be correlated with cores taken from the roadway.

(11) The minimum thickness of binder or surface course shall be two (2) inches. The maximum thickness that can be placed is four (4) inches provided the contractor can demonstrate that he can obtain the required density.

(12) In no case shall the speed of any roller exceed three (3) miles per hour. If a vibratory roller is used for compaction, special care shall be taken not to decompact the mixture by over-rolling. The number of roller passes is very critical to proper compaction.

(13) The surface course surface, when checked with a ten-foot straight edge parallel to the centerline, shall not exceed + or - one-fourth-inch.

(Ord. No. 91-9, Art. 1, § 4.12, 4-11-91; Ord. No. 99-32, Art. 1, 7-8-99)

**Sec. 11-132. Portland cement concrete pavement.**

Portland cement concrete pavement shall meet the AHTD Standard Specification requirements for Portland cement concrete pavement, with the following exceptions:

- (1) The depth of the concrete pavement shall be within  $\pm 1/4$  inch of the required depth shown in Table 2, Appendix A, plus any additional depth required as a result of a deficient subbase depth. The average of all depth measurements shall not be less than the required depth, and any depth in excess of the  $+ 1/4$  inch shall not be used in computing the average depth.
- (2) The concrete shall have a minimum twenty-eight-day compressive strength of four thousand (4,000) psi. The concrete shall contain an air entraining agent which produces five (5) percent  $\pm$  two (2) percent air entrainment in the concrete. The slump shall be two (2) to four (4) inches if conventional paving equipment is used, and one (1) to two (2) inches if slipform paving equipment is used.
- (3) The concrete shall be placed on an approved subbase or subgrade which shall be wetted just prior to placing the concrete.
- (4) After the concrete has been placed, consolidated and struckoff with a transverse screen or slipform paver, it shall be checked for surface smoothness with a ten-foot straightedge parallel to the centerline for surface. The straightedge shall be lifted and placed on the centerline and pulled to the edge of the pavement. Each time the straightedge is moved forward, it shall overlap the preceding area by at least one-half of the straightedge length. Any surface irregularities shall be corrected at this time while the concrete is still in a plastic condition. Care shall be taken in a slipform operation not to pull down the pavement edge during the straightedge operation.
- (5) Unless otherwise specified by the County Road Superintendent, the pavement lanes shall be tied together with thirty-inch #4 reinforcing bars on thirty-six-inch centers.
- (6) The concrete pavement shall be cured with a curing compound meeting the AHTD Standard Specifications for curing compound.
- (7) Unless otherwise specified by the County Road Superintendent, the transverse joints shall be sawed in the concrete pavement perpendicular to the centerline and on fifteen-foot centers. The depth of the joint shall not be less than one-fourth the slab thickness (T) plus one-half inch. The joint width shall be approximately one-fourth inch. The longitudinal centerline joint and the longitudinal joint between lanes of a four-lane roadway shall be sawed to the same joint depth and width dimensions, or the new lane may be keyed to the adjacent lane.
- (8) All joints shall be filled with a silicone joint material, preformed joint material, or joint material meeting the AHTD requirements for PCC pavement contraction and warping joint material. The joint preparation and installation of the joint material shall be in accordance with the manufacturer's recommendations.

(Ord. No. 91-9, Art. 1, § 4.13, 4-11-91; Ord. No. 99-32, Art. 1, 7-8-99)

**Sec. 11-133. Surface tests.**

The contractor shall check the surface of each material with a ten-foot straightedge, and any correction to the surface shall be made to the flexible layers prior to final compaction or to the concrete surface while the concrete is still plastic.

(1) The finished surface when checked with a ten-foot straightedge parallel to the center line shall show no deviation more than one-fourth-inch for ACHM surfaces or concrete surfaces.

(2) Skin patching and feather edging of the final surface course will not be permitted except at the beginning or ending of the project. Surface deviations in excess of one-fourth inch shall be corrected by grinding or overlaying, or as directed by the County Road Superintendent.

(Ord. No. 91-9, Art. 1, § 4.14, 4-11-91; Ord. No. 99-32, Art. 1, 7-8-99)

**Sec. 11-134. Structural concrete.**

(a) All structural concrete for traffic-bearing structures and any structures in which the surface may be exposed to de-icing chemicals, such as curbs, gutters, sidewalks, steps, pavements, driveways, bridge decks, parapet walls, drop inlets, etc., shall meet the AHTD requirements for Class S (AE) air entrained concrete with a minimum twenty-eight-day compressive strength of four thousand (4,000) psi.

(b) The concrete for all other non-traffic-bearing structures and structures not exposed to de-icing chemicals shall meet the AHTD requirements for Class A concrete with a minimum twenty-eight-day compressive strength of three thousand (3,000) psi.

(Ord. No. 91-9, Art. 1, § 4.15, 4-11-91; Ord. No. 99-32, Art. 1, 7-8-99)

Secs. 11-135--11-139. Reserved.

## **DIVISION 6. STORM DRAINAGE, PIPE AND PIPE UNDERDRAIN REQUIREMENTS\***

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**\*Editor's note:** Ord. No. 99-32, Art. I, adopted July 8, 1999, amended the Code by renumbering and amending former Div. 5, §§ 11-126--11-130 as a new Div. 6, §§ 11-140--11-144.

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### **Sec. 11-140. Minimum requirements.**

The plans and specifications for proposed storm drainage systems shall be equal to the following minimum standards:

(1) *Pipe:*

- a. Reinforced concrete pipe shall conform to AASHTO M 170 for circular pipe and to AASHTO M 206 for arch-shaped pipe. Class III shall be the minimum class of pipe used. The joint seal shall be either cement mortar, three (3) parts sand and one (1) part cement, or cold applied performed plastic gaskets conforming to AASHTO M 198, Type B.
- b. Corrugated steel pipe shall conform to AASHTO M 36, AASHTO M 190 for coated pipe and to AASHTO M 218 for sheets to form pipe. As an alternate to bituminous coated pipe, precoated pipe meeting the requirements of AASHTO M 245 and M 246, for Type B, may be substituted.
- c. The manufacturing and furnishing of corrugated aluminum pipe shall conform to the requirements of AASHTO M 196 and to AASHTO 197 for sheets to form pipe.
- d. Flared end sections shall be of the same material as the pipe for a given installation, except bituminous coating will not be required for metal ends when specified for the pipe. The steel sheets shall have a thickness of 0.064 inches or more.
- e. The reinforced concrete flared end section for circular and arch concrete pipe shall meet the applicable requirements for Class II or higher class of pipe.
- f. Corrugated metal pipe shall be capable of withstanding an H-20 load.
- g. Coupling band for corrugated metal pipe shall be the same metal as used in the pipe and shall be a single or double piece with bolts and angles.
- h. All pipe shall have a minimum cover at subgrade elevation of one (1) foot at the shoulder or curb, unless otherwise approved by the County Road Superintendent.

(Ord. No. 91-9, Art. 1, § 5.01, 4-11-91; Ord. No. 99-32, Art. 1, 7-8-99)

**Sec. 11-141. Excavation, trench preparation and installation.**

- (a) Where the pipe is laid below ground line, the trench shall be excavated to the required depth and width to allow sufficient room for tamping of backfill. The bottom of the trench shall be shaped to conform to the bottom of the pipe with recesses excavated to receive the bells where bell and spigot pipe are used. Where pipe is not laid in a trench, a uniform firm bed shall be made as specified above.
- (b) When rock is encountered in the trench, it shall be removed to minimum depth of six (6) inches below the pipe, and the excess depth shall be filled with a suitable material and compacted.
- (c) All unsuitable material, including soft and yielding material, shall be removed and replaced with suitable material and compacted to ensure a firm support.
- (d) The pipe shall not be laid in water or in unsuitable weather or trench conditions unless approved by the County Road Superintendent.
- (e) After each joint of pipe has been graded, aligned and placed in final position, the bedding material shall be deposited and compacted under and around each side of the pipe and back of the bell, or the end thereof, to firmly hold and maintain the pipe in proper position and alignment and backfilling operations.
- (f) No debris creating a clogging action shall be allowed to remain in the storm drainage system.
- (g) All storm drainage pipe, under any roadway improvement, shall be backfilled with SB-2, SB-3 base or material approved by the County Road Superintendent and compacted before the base and curb and gutter are constructed. The backfill base material shall be brought up evenly on each of the pipes to avoid displacement. Special care shall be taken to compact the material under the haunches of the pipe. The base material shall be compacted with mechanical equipment to at least ninety-eight (98) percent of the maximum density as determined by AASHTO T 180.
- (h) When culvert pipe is to be relayed, the construction procedures shall be in accordance with the AHTD Standard Specification requirements for relaying culvert pipe.
- (i) When structural plate pipe and arches are used, the materials and construction procedures shall be in accordance with the AHTD Standard Specification requirements for structural plate pipe and arches. Flared end sections may be used when approved by the County Road Superintendent.

(Ord. No. 91-9, Art. 1, § 5.02, 4-11-91; Ord. No. 99-32, Art. 1, 7-8-99)

**Sec. 11-142. Headwalls, drop inlets and junction boxes.**

- (a) All drainage structures shall be constructed of reinforced concrete.
- (b) The minimum thickness of reinforced concrete walls, floors, and tops shall be six (6) inches.
- (c) Concrete drainage structures shall be constructed with reinforcing steel having a maximum spacing of twelve (12) inches on centers and a minimum size of #4 bar.
- (d) Concrete bottoms for structures shall be poured at least twenty-four (24) hours prior to beginning construction of the vertical walls.
- (e) Junction boxes shall have a minimum interior dimension of four (4) feet.
- (f) Walls shall be constructed to form a tight joint with the floor and around the inlet and outlet pipes. The pipes shall be flush with the inside surface of the wall.
- (g) Unless otherwise directed by the County Road Superintendent, all drop inlets, box culverts and junction boxes shall have two-inch to three-inch weep holes at the subgrade elevation.
- (h) Headwalls shall be constructed on the upstream and downstream sides of the storm drainage system where no other drainage structures are required, or flared end sections may be used when approved by the County Road Superintendent.

(Ord. No. 91-9, Art. 1, § 5.03, 4-11-91; Ord. No. 99-32, Art. 1, 7-8-99)

**Sec. 11-143. Rings, covers, grates and frames.**

- (a) Iron castings shall conform to ASTM A 48 Class 30A for gray iron castings.
- (b) The combined weight of the ring and lid for sidewalk type shall be a minimum of one hundred twenty-five (125) pounds and for the street type shall be a minimum of three hundred (300) pounds.

(Ord. No. 91-9, Art. 1, § 5.04, 4-11-91; Ord. No. 99-32, Art. 1, 7-8-99)

**Sec. 11-144. Pipe underdrain.**

- (a) Pipe underdrain shall be installed in all sidehill cut sections any area where subsurface water is encountered and other areas as determined by the County Road Superintendent.
- (b) The underdrain shall be located just behind the curb.
- (c) Outlets shall be provided on at least three hundred-foot intervals, or as approved by the County Road Superintendent. To the extent possible, the underdrain pipe should be connected to the drop inlets or box culverts of the storm drainage system.

(d) The underdrain material and construction procedures shall be in accordance with the AHTD Standard Specifications for pipe underdrain, with the following exceptions:

- (1) Only corrugated polyethylene tubing and acrylonitrile - butadiene - styrene pipe shall be used in the construction of pipe underdrain.
- (2) Granular filter material shall meet the requirements of the AHTD Standard Specifications for coarse aggregate for Class A concrete or the pavement filter blanket material requirements contained in this Article.
- (3) The nonwoven geotextile fabric having the following properties shall be used as a liner for the pipe underdrain:

TABLE INSET:

Properties	Test Procedure	Value
Weight, oz./sq. yd.	ASTM D - 1910	4.1 min.
Thickness, mils	ASTM D - 1777	40 min.
Tensile strength, lbs.	ASTM D - 1682	115 min.
Elongation, percentage	ASTM D - 1682	55 min.
Puncture strength, lbs.	ASTM D - 751	70 min.
	(Modified)	
Mullen burst strength, psi	ASTM D - 751	260 min.
Coefficient of permeability,	Constant head	0.10 min.
cm./sec.		

(4) Trenches shall be excavated to a minimum depth of twenty-six (26) inches below the top of the curb or as directed by the County Road Superintendent.

(5) Following excavation of the trench, the nonwoven geotextile fabric line shall be placed in the trench. The liner shall be of sufficient width to cover the bottom and sides of the trench and lap a minimum of one (1) foot across the top of the granular filter material used to backfill above the top of the pipe.

(Ord. No. 91-9, Art. 1, § 5.05, 4-11-91; Ord. No. 99-32, Art. 1, 7-8-99)

Secs. 11-145--11-149. Reserved.

## **DIVISION 7. INSPECTION AND SAMPLING AND TESTING REQUIREMENTS\***

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**\*Editor's note:** Ord. No. 99-32, Art. I, adopted July 8, 1999, amended the Code by renumbering and amending former Div. 6, §§ 11-136 and 11-137 as a new Div. 7, §§ 11-151 and 11-152.

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### **Sec. 11-150. Inspections.**

- (a) The following three (3) types of inspections will be made during the progress of the project:
- (1) Intermediate progress inspections, which can be made at any time.
  - (2) Phase inspections which are required at the completion of a major phase of work.
  - (3) Final acceptance inspection which will be made upon the completion of all work.
- (b) All inspections will be made by the County Road Superintendent or his designated representative. The phase inspections and the final inspection will be made with the contractor and the engineer.
- (c) The County Road Superintendent has the authority to increase the amount of inspections and/or sampling and testing.
- (d) A phase inspection is required upon the completion of the following phases of work:
- (1) Completion of the subgrade.
  - (2) Completion of the base course and curb and gutter.
  - (3) Completion of the paving.
- (e) Any work performed on a phase prior to the approval of the previous phase shall be removed and replaced with satisfactory materials and workmanship.
- (f) All unsatisfactory work or materials shall be removed and replaced with satisfactory materials and workmanship.
- (g) If the project is long, the phase inspections may be made on a smaller portion of the project, but not less than one thousand (1,000) feet in length.
- (h) The engineer is responsible for contacting the County Road Superintendent at least twenty-four (24) hours prior to the need of a major phase inspection.
- (i) The engineer will accompany the County Road Superintendent and/or his designated representative on all inspections.

(Ord. No. 91-9, Art. 1, § 6.01, 4-11-91; Ord. No. 99-32, Art. 1, 7-8-99)

### **Sec. 11-151. Testing.**

(a) The Developer shall, with the approval of the County Road Superintendent, retain the services of a testing laboratory or registered professional engineer, practicing in the materials and testing field, hereafter referred to as the lab engineer, to perform all sampling and testing. The Developer will be responsible for the costs of all sampling and testing performed on the project, including any additional sampling and testing as a result of failing tests and/or poor workmanship.

(b) The lab engineer will report all test results to the County Road Superintendent.

(c) In the case of failing tests or poor workmanship, the County Road Superintendent may direct the lab engineer to perform additional sampling and testing. The Developer will be responsible for the costs of any additional sampling and testing resulting from failing tests and/or poor workmanship.

(d) The following is the minimum sampling and testing frequency:

(1) *Cross drain backfill*: Minimum of one (1) density test per pipe or box culvert location.

(2) *Storm drain backfill*: Minimum of one (1) density test per five hundred (500) lineal feet of pipe when the storm drain is located in the street or under the curb and gutter.

(3) *Embankment*: Minimum of one (1) density test per layer per five hundred (500) lineal feet or roadway.

(4) *Subgrade*: Minimum of one (1) density test, one (1) LL and one (1) PI per five hundred (500) lineal feet of roadway with a minimum of three (3) density tests and three (3) depth measurements per project. Also, there will be a minimum of one (1) gradation test and one (1) PI test per project.

(5) *Lime treated subgrade*: Minimum of one (1) density test, one (1) depth measurement, one (1) LL and one (1) PI per five hundred (500) lineal feet of roadway with a minimum of three (3) density and three (3) depth measurements per project.

(6) *Base course*: Minimum of one (1) density test and one (1) depth measurement (depth sounding) per five hundred (500) lineal feet of roadway, with a minimum of three (3) density tests and three (3) depth measurements per project. Also, there will be a minimum of one (1) gradation test and one (1) PI test per project.

(7) *Asphalt stabilized base (black base), ACHM binder, and ACHM surface courses*: For each material, a minimum of one (1) density test and one (1) depth measurement per five hundred (500) lineal feet of roadway, with a minimum of three (3) density tests and three (3) depth measurements per project. Also, there will be a minimum of one (1) extraction to determine the asphalt content and aggregate gradation for each material for the project.

(8) *Structural concrete for drainage structures:* A minimum of one (1) set of three (3) concrete cylinders per fifty (50) cubic yards of concrete or portion thereof. One (1) cylinder will be broken at seven (7) days and the other two (2) will be broken at twenty-eight (28) days.

(9) *Structural concrete for curb and gutter:* A minimum of one (1) set of three (3) concrete cylinders per one thousand (1,000) lineal feet of curb and gutter. One (1) cylinder will be broken at seven (7) days and the other two (2) will be broken at twenty-eight (28) days.

(10) *Concrete pavement:* A minimum of one (1) set of three (3) concrete cylinders per five hundred (500) lineal feet of pavement, with a minimum of one (1) set per project. The set shall be broken in seven (7) and twenty-eight (28) days as described above. Also, one (1) core and depth measurement per five hundred (500) feet of completed pavement with a minimum of one (1) per project.

(Ord. No. 91-9, Art. 1, § 6.02, 4-11-91; Ord. No. 99-32, Art. 1, 7-8-99)

Secs. 11-152--11-159. Reserved.

## **DIVISION 8. ACCEPTANCE OF MATERIAL AND WORKMANSHIP\***

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**\*Editor's note:** Ord. No. 99-32, Art. I, adopted July 8, 1999, amended the Code by renumbering and amending former Div. 7, § 11-146, as a new Div. 8, § 11-160.

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### **Sec. 11-160. Corrective actions.**

The following provides for corrective actions to be taken and/or provisions for accepting a street or road into the County System when test results indicate non-specification materials or workmanship have been incorporated into the project. Any penalties which are assessed shall be paid to the Washington County Road Department Fund by the owner/developer before a street or road will be accepted by Washington County. The penalties paid into the Washington County Road Department Fund shall be used at the discretion of the County Judge to maintain and/or construct roads and streets in Washington County.

(1) *Density for embankment, subgrade, pipe backfill, and crushed stone base course:* Recompress until the minimum density is obtained.

(2) *Depth of lime treated subgrade:* The depth of the lime treated subbase shall be at least five and one-half (5 1/2) inches. If the depth is less than five and one-half (5 1/2) inches, additional lime shall be added to the section represented by the test and the section reprocessed.

(3) *Depth of crushed stone base course:* The depth of the crushed stone base shall be within  $\pm$  1/2 inch of the required depth. If the deficient depth is greater than one-half inch of the required depth, the existing material represented by the test(s) will be ripped up, new added and recompressed to the proper density. The average of all depth measurements shall not be less than the required depth shown in Table 2, Appendix A, and any depth in excess of + 1/2 inch will not be used in computing the average depth. If not, the deficient depth will be added to the required depth of the surface course or concrete pavement.

(4) *Density for asphalt treated base or cement treated base:* When any individual density is below ninety-five (95) percent, the section represented by this test will be removed and replaced. The average of all densities shall be ninety-eight (98) percent or greater. If the average density of the project is below ninety-eight (98) percent the following penalties shall be assessed:

97.5 percent to 97.9 percent— 3 percent of the cost of the in-place material.

97.0 percent to 97.4 percent— 5 percent of the cost of the in-place material.

96.0 percent to 96.9 percent—10 percent of the cost of the in-place material.

95.0 percent to 95.9 percent—25 percent of the cost of the in-place material.

Below 95 percent—Remove and replace.

(5) *Depth of asphalt treated base or cement treated base:* The depth of the asphalt treated base or the cement treated base shall be within  $\pm 1/2$  inch of the required depth. The average of all depth measurements shall not be less than the depth shown in Table 2, Appendix A, and any depth in excess of  $+ 1/2$  inch will not be used in computing the average depth. If not, the deficient depth will be added to the required depth of the surface course or concrete pavement.

(6) *Density of ACHM binder and surface:* No individual density shall be lower than ninety (90) percent of maximum theoretical density. Any section with a density below that value shall be removed and replaced. The average of all densities for the project shall be not less than ninety-two (92) percent of maximum theoretical density. If this average is less than ninety-two (92) percent, the following penalties shall be assessed:

91.5 percent to 91.9 percent-- 3 percent of the cost of the in-place material.

91.0 percent to 91.4 percent-- 5 percent of the cost of the in-place material.

90.5 percent to 90.9 percent--15 percent of the cost of the in-place material.

90.0 percent to 90.4 percent--30 percent of the cost of the in-place material.

Below 90.0 percent--Remove and replace.

(7) *Depth of ACHM binder:* The depth of the binder shall be within  $\pm 3/8$  inch of the required depth. The average of all depth measurements shall not be less than the depth shown in Table 2, Appendix A, and any depth in excess of  $+ 3/8$  inch will not be used in computing the average depth. If not, the deficient depth will be added to the required depth of the surface course or concrete pavement.

(8) *Depth of ACHM surface:* The depth of the asphalt hot mix surface course shall be within  $\pm 1/4$  inch of the required depth plus any additional depth(s) required due to deficient depths in the base and binder courses. The average of all depth measurements shall not be less than the required depth, and any depth in excess of  $+ 1/4$  inch will not be used in computing the average depth. If the average depth is less, it will be corrected by overlaying with additional ACHM surface, or as directed by the County Road Superintendent.

(9) *Surface tolerance of ACHM surface:* If the surface deviation is greater than  $+ 1/4$  inch when checked with a ten-foot straight edge, the surface smoothness will be corrected as directed by the County Road Superintendent.

(10) *Class A structural concrete strength:* The average twenty-eight-day compressive strength of the two (2) cylinders of a set shall be at least three thousand (3,000) psi. If the average strength is lower, the following penalties shall be assessed:

2,750 to 2,999 psi-- 5 percent of the cost of the in-place material.

2,500 to 2,749 psi--10 percent of the cost of the in-place material.

2,250 to 2,499 psi--20 percent of the cost of the in-place material.

2,000 to 2,249 psi--40 percent of the cost of the in-place material.

Below 2,000 psi--Remove and replace.

(11) *Class S (AE) air entrained structural concrete strength:* The average twenty-eight-day compressive strength of the two (2) cylinders of a set shall be at least four thousand (4,000) psi. If the average strength is lower, the following penalties shall be assessed:

3,750 to 3,999 psi-- 5 percent of the cost of the in-place material.

3,500 to 3,749 psi--10 percent of the cost of the in-place material.

3,250 to 3,499 psi--20 percent of the cost of the in-place material.

3,000 to 3,249 psi--40 percent of the cost of the in-place material.

Below 3,000 psi--Remove and replace.

(12) *Concrete pavement strength:* The average twenty-eight-day compressive strength of the two (2) cylinders of a set shall be at least four thousand (4,000) psi. If the average strength is lower, the following penalties shall be assessed:

3,750 to 3,999 psi-- 3 percent of the cost of the in-place material.

3,500 to 3,749 psi-- 7 percent of the cost of the in-place material.

3,250 to 3,499 psi--15 percent of the cost of the in-place material.

3,000 to 3,249 psi--25 percent of the cost of the in-place material.

2,500 to 2,999 psi--40 percent of the cost of the in-place material.

Below 2,500 psi--Remove and replace.

(13) *Concrete pavement depth:* The concrete pavement depths shall be within  $\pm 1/4$  inch of the required depth plus any additional depth required as a result of deficient subbase depth. The average of all depth measurements shall not be less than the required depth, and any depth in excess of  $+ 1/4$  inch will not be used in computing the average depth. If the average depth is less, the following penalties shall be assessed:

Required depth to  $- 1/8$  inch-- 1 percent of the cost of the in-place material.

Minus  $1/8$  to  $- 1/4$  inch-- 3 percent of the cost of the in-place material.

Minus  $1/4$  to  $- 3/8$  inch-- 7 percent of the cost of the in-place material.

Minus  $3/8$  to  $- 1/2$  inch --15 percent of the cost of the in-place material.

Minus  $1/2$  to  $- 5/8$  inch --25 percent of the cost of the in-place material.

Minus  $5/8$  to  $- 3/4$  inch --40 percent of the cost of the in-place material.

More than minus  $3/4$  inch--Remove and replace.

(14) *Surface tolerance of concrete pavement:* The concrete surface shall not show any deviation greater than one-fourth ( $1/4$ ) inch when checked with a ten-foot straight edge. Any deviation greater than this shall be corrected by grinding, removing and replacing, or as directed by the County Road Superintendent.

(Ord. No. 91-9, Art. 1, § 7.01, 4-11-91; Ord. No. 99-32, Art. 1, 7-8-99)

Sec. 11-161. Reserved.

**APPENDIX A STREET AND PAVEMENT SPECIFICATIONS**

TABLE 1. STREET FUNCTIONAL CLASSIFICATION FOR LAND DEVELOPMENTS.

TABLE INSET:

<b>DESIGN REQUIREMENTS</b>	<b>Alley</b>	<b>Dead-End Street</b>	<b>Residential</b>	<b>Collector</b>	<b>Arterial</b>	<b>Boulevard</b>
MIN. ROW WIDTH w/ SHOULDERS	30'	60'	60'	80'	90'	100'
MIN. ROW WIDTH w/ CURB AND GUTTER	30'	50'	50'	60'	80'	90'
MIN. FORE/BACK SLOPE	3:1/2:1	3:1/2:1	3:1/2:1	3:1/2:1	3:1/2:1	3:1/2:1
PAVEMENT SECTION	Shoulder or C&G					
PAVEMENT WIDTH w/ SHOULDERS	10' Min	20'	20'	24'	48'	n/a
SHOULDER WIDTH	2' Min	4'	4'	10'	8'	n/a
PAVEMENT WIDTH w/ CURB AND GUTTER	14' B-B Min	24' B-B	28' B-B	36' B-B	48' B-B Min	2@24'
MIN. MEDIAN WIDTH	n/a					10'
PAVEMENT THICKNESS	See Notes 1 and 2					
SHOULDER THICKNESS	See Note 1					
PARKING	See Note 3				None	None
SIDEWALKS	No	Optional	Optional	Optional	Optional	Optional
STREET SPACING	300' to 1400'					

<b>DESIGN REQUIREMENTS</b>	<b>Alley</b>	<b>Dead-End Street</b>	<b>Residential</b>	<b>Collector</b>	<b>Arterial</b>	<b>Boulevard</b>
DESIGN SPEED	10 MPH	20 MPH	25 MPH	35 MPH	45 MPH	45+ MPH
MIN. SIGHT DISTANCE CREST VERT CURVE	110'	200'	250'	300'	350'	350'
INT. TO CURB CUT/DRIVE	n/a	40'	40'	40'	50'	50'
MIN. CURB RADIUS	10'	25'	25'	40'	50'	50'
MIN. STREET JOG	See Note 4			200'	200'	200'
STREET GRADES	See Note 5					
MIN. INTER. APPROACH SPEED	25 MRH See Note 6					
MIN. INTER. SIGHT DISTANCE	90' See Note 6					
MAX. INTER. GRADE WITHIN 100'	Flat See Note 6					
MIN. INTERSECTION ANGLE	75 Degrees					
MAX. RES. DRIVEWAY WIDTH	24'					
MAX. COMM/INDUS DRIVEWAY WIDTH	40'					
BR. / CULV. DESIGN LOAD	H-20					
SERVICE VOLUME (VEHICLES PER DAY)	<200	<500	<3,000	<6,000	<25,000	<25,000

Street functional classification definitions (taken from Appendix D):

*Alley:* A minor public way dedicated to public use for utility easements and public access to the back or side of properties abutting a street. Alleys are not intended for use as private drives and will not maintained as such.

*Arterial:* A street or road of considerable continuity which serves or is intended to serve as a principal traffic way between separate areas, districts, communities or densely developed areas; and is the main means of access to the primary street system or expressway.

*Boulevard:* A street or road that could be either a collector or arterial by functional classification, but also has the design feature of a center median separating opposing directions of traffic, and has breaks in the median only at intersecting streets no closer than 300 feet.

*Collector:* A street which, in addition to serving abutting properties, intercepts minor streets, connects with community facilities and carries neighborhood traffic to major arterial street systems.

*Dead-end street:* A street having one end open to traffic and being permanently terminated by a vehicular turnaround.

*Residential:* Minor streets used primarily to provide access to abutting properties.

General note: Any street or roadway construction involving federal and/or state highway department funds shall meet the federal/state requirements.

General note: If the developer requests reduction to the street widths or pavement section and/or right of way width, the county judge may obtain the services of a knowledgeable registered professional engineer to review the site, the developer's proposal and submit a written report with recommendations. The developer shall agree to the engineering study and shall be responsible for reimbursing the county for any engineering study fee.

Note 1: The pavement structure shall meet or exceed the pavement structure in Table 2 for the particular traffic classification and soil type.

Note 2: In curb and gutter sections, the full pavement structure shall be carried the full width from curb to curb.

Note 3: On-street parking shall not be permitted on arterial classifications. Parking on other streets shall be regulated by the county on each individual street.

Note 4: Normally the distance shall be 150 feet, however this distance may be varied in unusual terrain and topography.

Note 5: See subsection 11-90(9).

Note 6: For all road classifications except arterials and boulevards, the approach speed in hilly terrain may be reduced to 20 mph; the sight distance reduced to 70 feet; and the grade within 100 feet of the intersection increased to 4 percent.

(Ord. No. 2005-57, Art. 1, 10-13-05)

**Table 2. MINIMUM PAVEMENT SECTION BY STREET AND SOIL CLASSIFICATION**  
**TABLE INSET:**

Class of St.	Soil Classification		SN	Double	Composite	Composite	Full Dept.	Concrete
	Group	Soil	Req.	Chip Seal	Flexible	Flexible	Asphalt	Pavement
	Index	Description	Note 2	(SN)	(SN)	(SN)		
I/II	A-1	Gravel/Sand		DBST	2" Surf.	2" Surf.	2" Surf.	5" PCC
	A-2	No Clay	1.70	6" Base	6" Base	4" CTBase	4" B.Base	Pavement
	A-3			(N/A)	(1.72)	(1.88)	(1.88)	Note 1
I/II	A-4	Silt, Silty	1.85	DBST	2" Surf.	2" Surf.	2" Surf.	5 1/2" PCC
	A-6	Sand, Sandy	1.85	7" Base	7" Base	4" CTBase	4" B.Base	Pavement
		Silty Clay		(N/A)	(1.86)	(1.88)	(1.88)	Note 1
I/II	A-5	Clay		DBST	3" Surf.	2" Surf.	2" Surf.	6" PCC
	A-7	LL over 40	2.35	8" Base	8" Base	6" CTBase	6" B.Base	Pavement
	A-7-6	PI over 10		(N/A)	(2.44)	(2.38)	(2.38)	Note 1

Class	Soil Classification		SN	Double	Composite	Composite	Full Dept.	Concrete	
	of	Group	Soil	Req.	Chip Seal	Flexible	Flexible	Asphalt	Pavement
	St.	Index	Description	Note 2	(SN)	(SN)	(SN)		
III	A-1	Same as above			2 1/2 Surf.	2" Surf.	2" Surf.	5 1/2" PCC	
	A-2		1.85	(N/A)	6" Base	4" CTBase	4" B.Base	Pavement	
	A-3	Gravel/Sand			(1.94)	(1.88)	(1.88)	Note 1	
<hr/>									
III		Same as above			2" Surf.	2" Surf.	2" Surf.	6" PCC	
	A-4		2.30	(N/A)	2" Bind.	6" CTBase	6" B.Base	Pavement	
	A-6	Silt			4" Base	(2.38)	(3.28)	Note 1	
					(2.32)				
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III	A-5	Same as above			2" Surf.	2" Surf.	2" Surf.	6 1/2" PCC	
	A-7		3.15	(N/A)	3" Bind.	2" Bind.	2" Bind.	Pavement	
	A-7-6	Clay			7" Base	6" CTBase	6" B.Base	Note 1	
					(3.18)	(3.26)	(3.26)		
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Class	Soil Classification		SN	Double	Composite	Composite	Full Dept.	Concrete
	of	Group	Soil	Req.	Chip Seal	Flexible	Flexible	Asphalt
St.	Index	Description	Note 2	(SN)	(SN)	(SN)		
IV	A-1	Same as above			3" Surf.	2" Surf.	2" Surf.	6 1/2" PCC
	A-2		2.30	(N/A)	6" Base	6" CTBase	6" B.Base	Pavement
	A-3	Gravel/Sand			(2.30)	(2.38)	(2.38)	Note 1
<hr/>								
IV		Same as above			2" Surf.	2" Surf.	2" Surf.	7" PCC
	A-4		2.75	(N/A)	3" Binder	6" CTBase	6" B.Base	Pavement
	A-6	Silt			4" Base	(2.82)	(2.82)	Note 1
					(2.76)			
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IV	A-5	Same as above			2" Surf.	2" Surf.	2" Surf.	7 1/2" PCC
	A-7		3.45	(N/A)	4" Bind.	3" Bind.	3" Bind.	Pavement
	A-7-6	Clay			6" Base	5" CTBase	5" B.Base	Note 1
					(3.48)	(3.45)	(3.45)	

**CLASS V OR HIGHER BY FORMAL DESIGN ONLY, using PCA, TAI, AASHTO, or other formal Pavement Design Procedures.**

Note 1: Unless otherwise approved by the County Road Superintendent, all PCC pavements shall have a minimum of 2 inches of special subbase unless the County Road Superintendent specifies a thicker depth, but in no case shall the depth of the special subbase exceed 4 inches. The special subbase specifications are contained in Chapter 50-G(sic).

Note 2: A pavement structure of 6 to 8 inches of compacted crushed stone base and a double bituminous surface treatment may be approved for residential street and County roads with light traffic and little or not truck traffic. Such conditions may occur in the following; (1) Small rural subdivisions and mobile home parks; (2) Rural subdivisions and mobile home parks with large 3 to 5 acre lots; or (3) existing minor county roads meeting this criteria.

The above table contains a few of the more commonly used pavement material combinations. The engineer, with the approval of the County Road Superintendent, may use the other material combinations if the flexible pavement layered theory is followed; the required structural number (SN) is provided; and the minimum layer thickness and the material coefficients shown, below are used, with the exception that the ACHM Surface thickness as indicated in the table is the minimum thickness allowed for each minimum pavement section shown. The LL and PI Test results allowed for each minimum pavement section shown. The LL and PI test results of the subgrade shall be used or verifying the final pavement surface. If the developer requests reduction to the street widths or pavement section and/or right-of-way width, the County Judge may obtain the services of a knowledgeable registered professional engineer to review the site, the Developer's proposal and submit a written report with recommendations. The Developer shall agree to the engineering study for any engineering study fees.

**TABLE INSET:**

TYPE OF MATERIAL	MATERIAL COEFFICIENT PER INCH OF MATERIAL	MINIMUM LAYER THICKNESS
Double Bituminous Surface Treatment.....	_*-	*Note*
Portland Cement Concrete Pavement.....	**-	5 inches
Special Subbase.....	**-	*Note 1*
ACHM.....	0.44	2 inches
ACHM.....	0.44	2 inches
Asphalt Stabilized Base (Black Base).....	0.25	4 inches
Cement Treated Crushed Stone Base.....	0.25	4 inches
Treated Subgrade.....	0.00	6 inches
Crushed Stone Base (SB-2 or SB-3).....	0.14	4 inches
Gravel Base Course (GB-2 or GB-3).....	0.11	4 inches
Soil Cement (400 to 600 PSI).....	0.20	6 inches
Levelup Course.....	0.00	Thickness as Needed

\_\*-: Bituminous surface treatment have no specified thickness and are not considered a structural layer. They add little or no strength to the pavement structure.

\*\* -: Part of the rigid pavement design, and the flexible pavement coefficients do not apply.

## **APPENDIX B FIGURES**

Plan--Figure 1

Reinforced Concrete Drop Inlet and Catch Basin--Figure 2

Typical Concrete Swale--Figure 3

Pipe Culvert Headwall, Wing-wall--Figure 4

Typical Sidewalk Sections--Figure 5

Concrete Combination Curb and Gutter--Figure 6

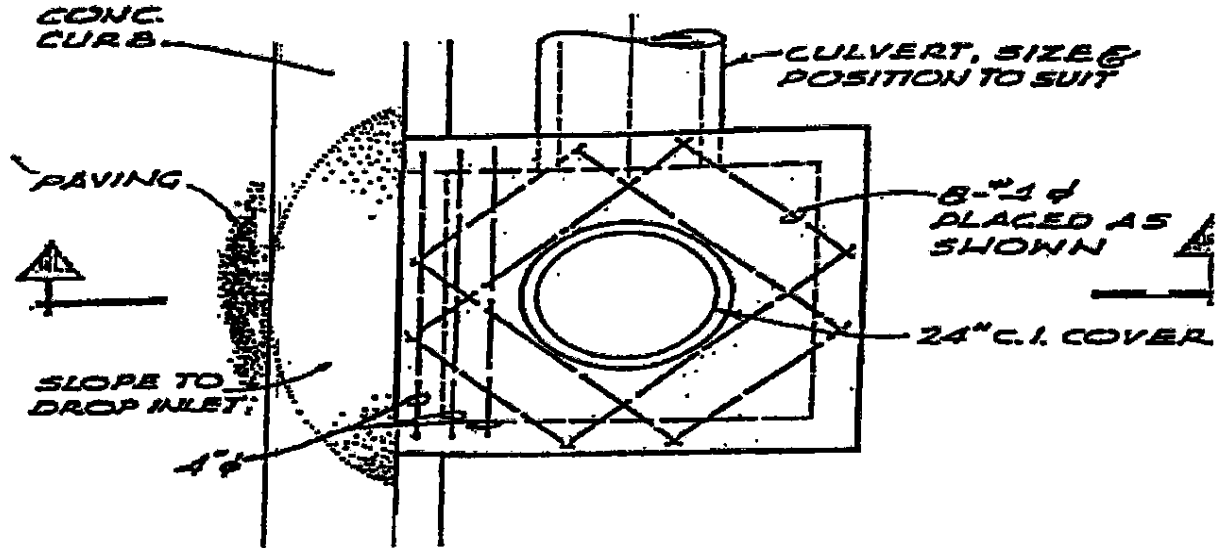
Curb Section--Figure 7

Typical Section Of Repair For Utility Cuts On Paved County Roads--Figure 8

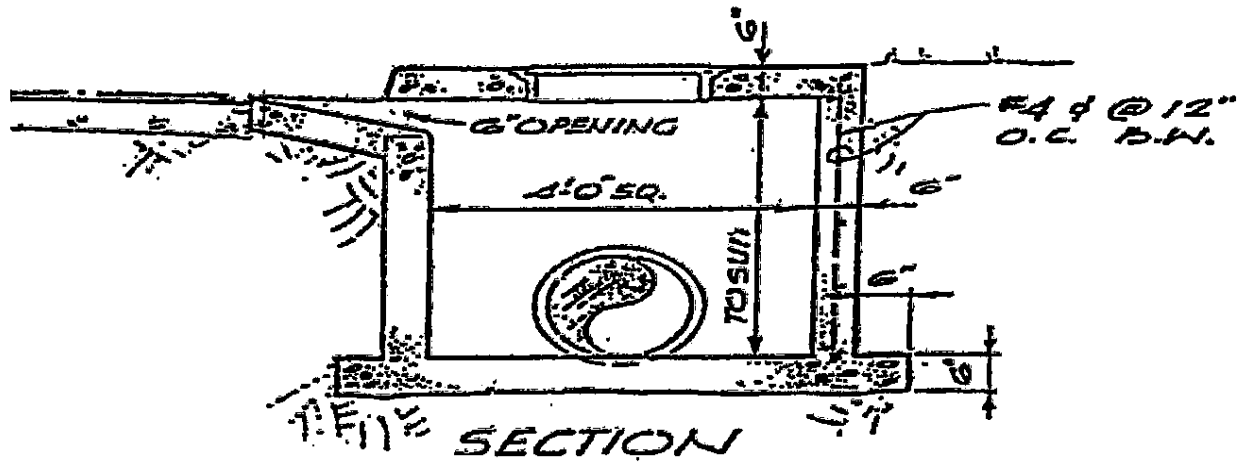
Typical Sections For Rural Class I, II, III, & IV Streets and Roads--Figure 9

Typical Driveway Cut--Figure 10

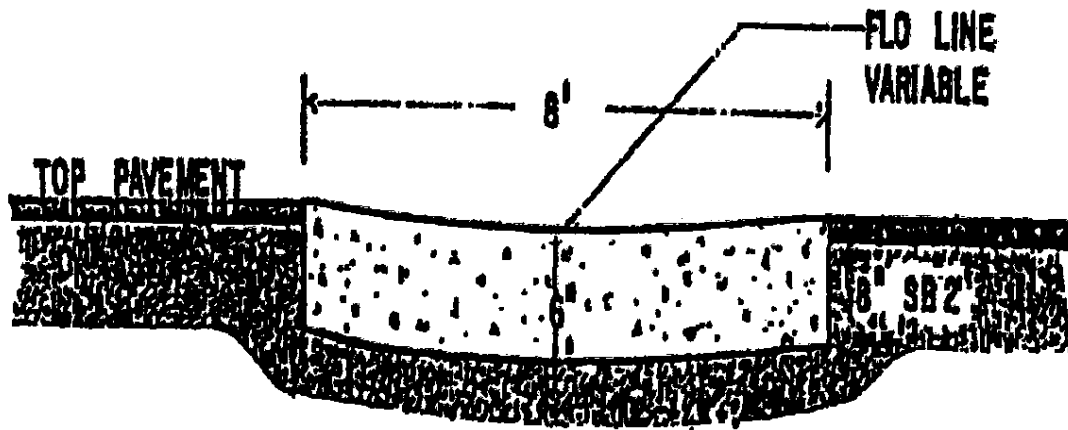
### Plan--Figure 1



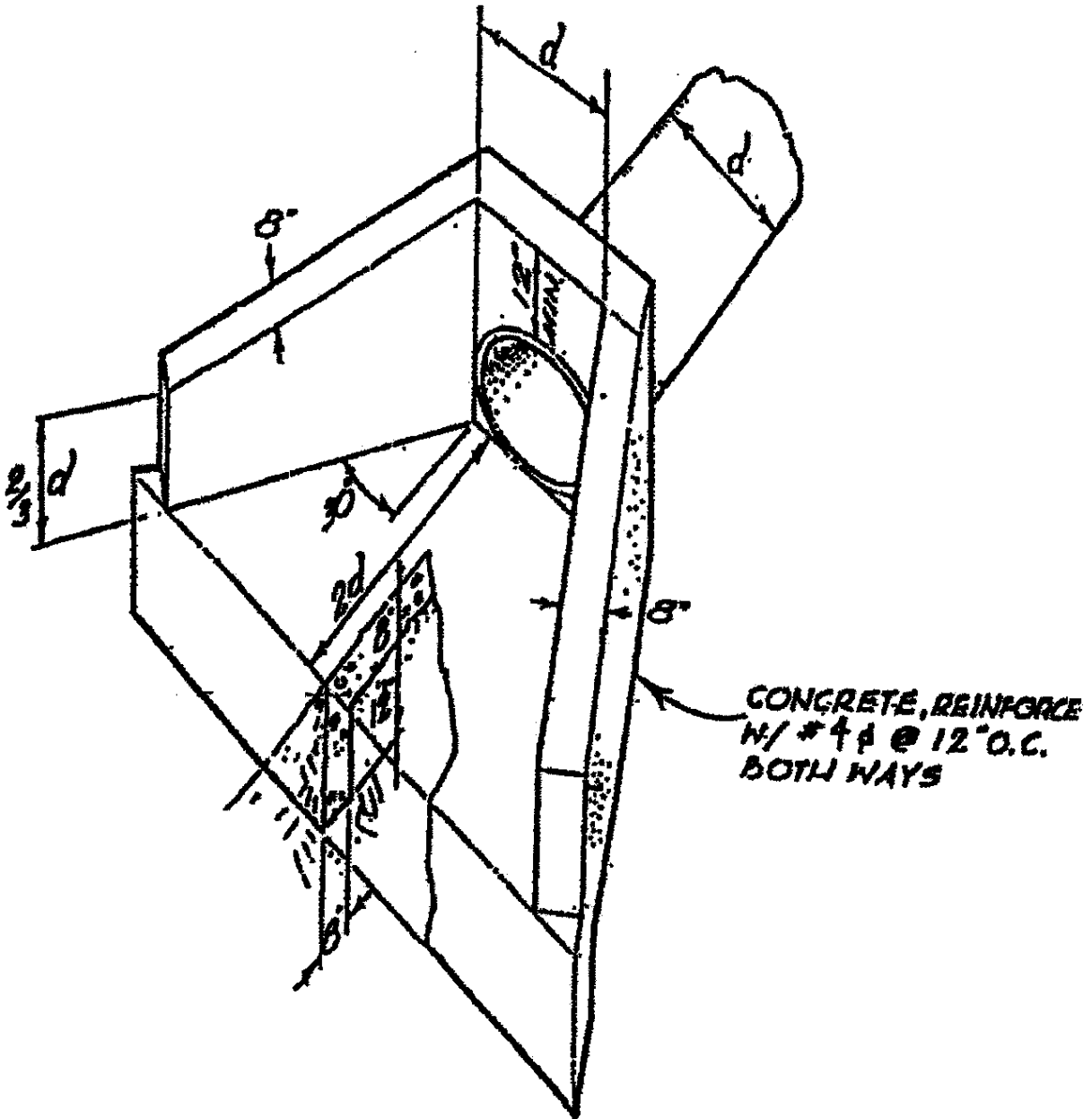
### Reinforced Concrete Drop Inlet and Catch Basin--Figure 2



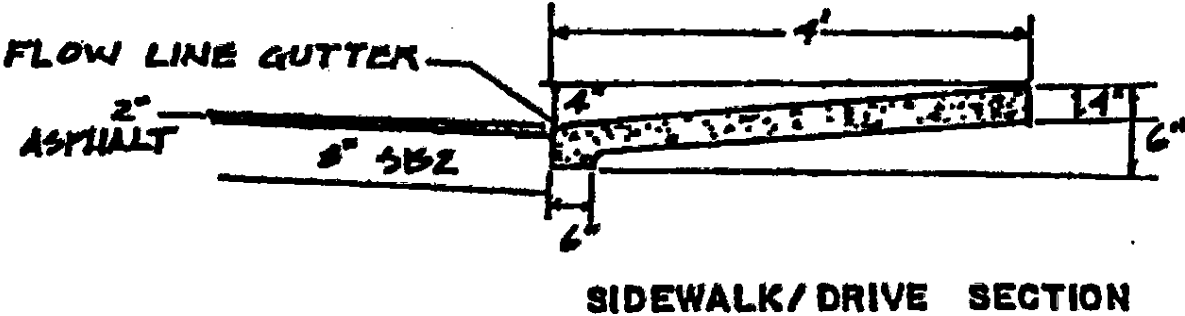
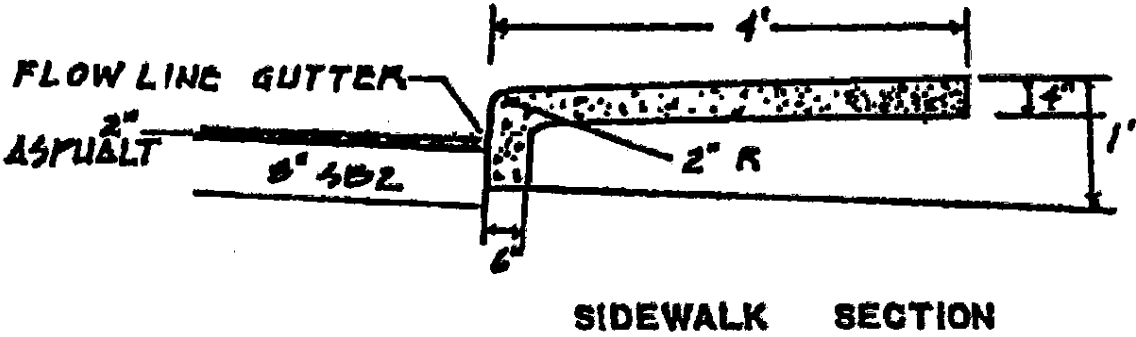
### Typical Concrete Swale--Figure 3



### Pipe Culvert Headwall, Wing-wall--Figure 4

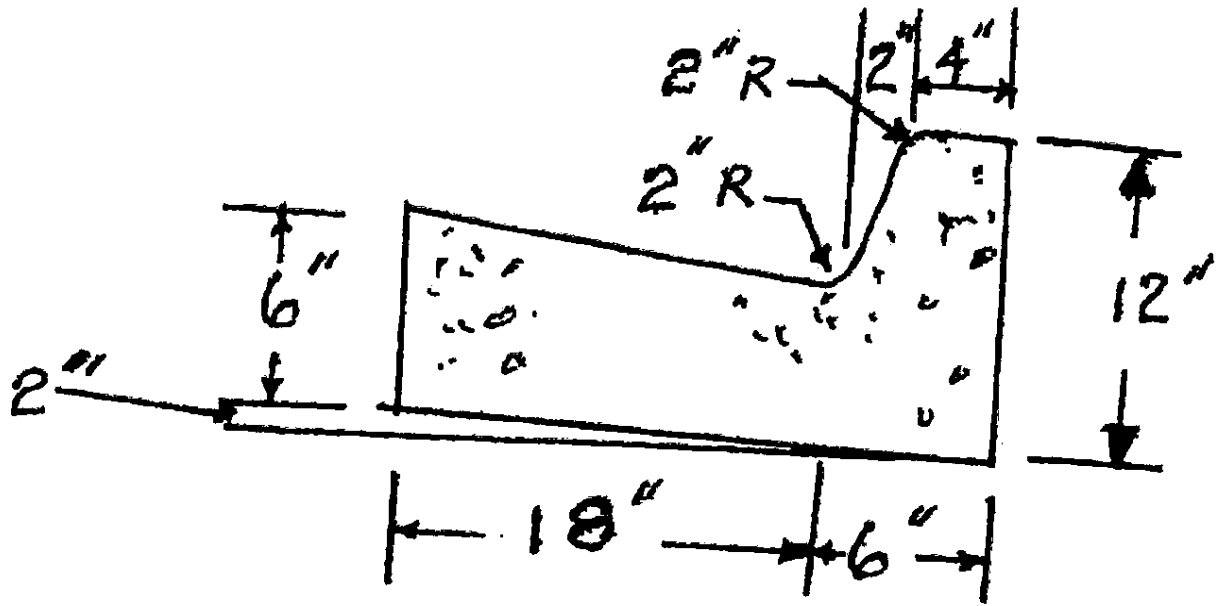


Typical Sidewalk Sections--Figure 5

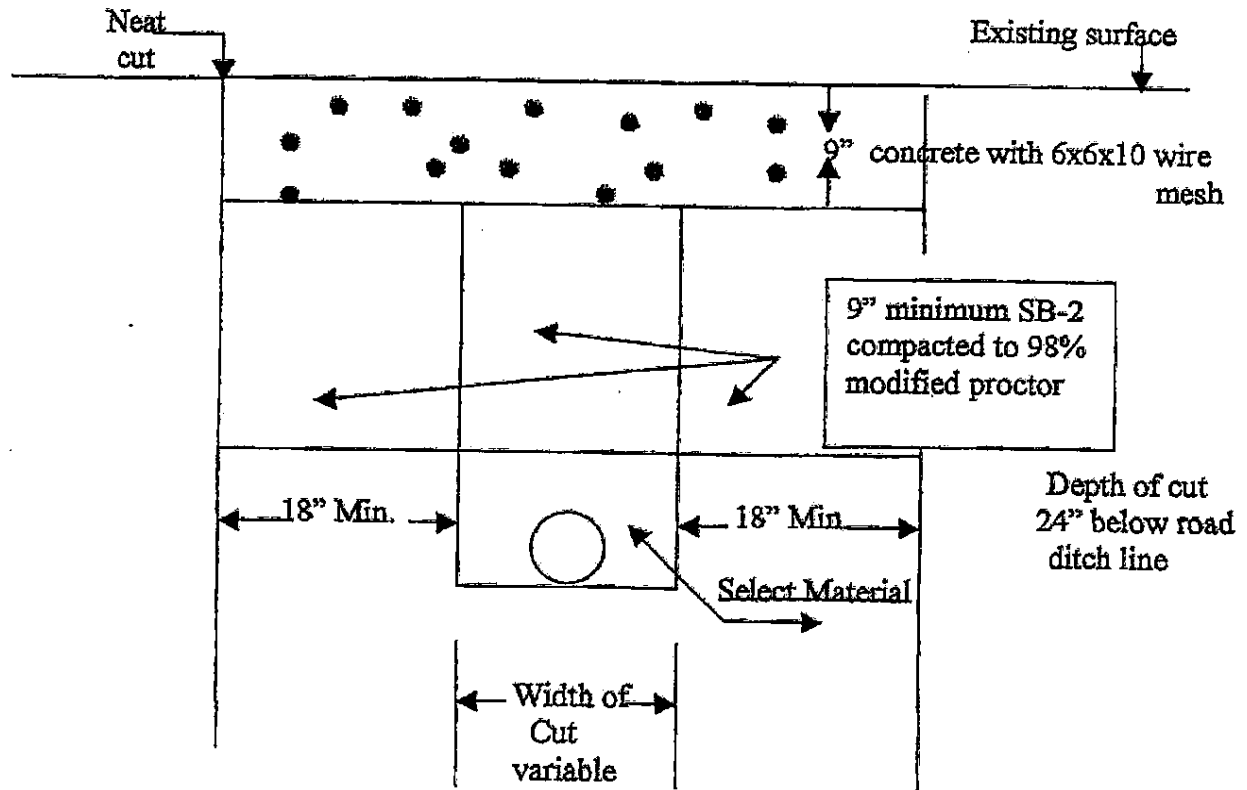




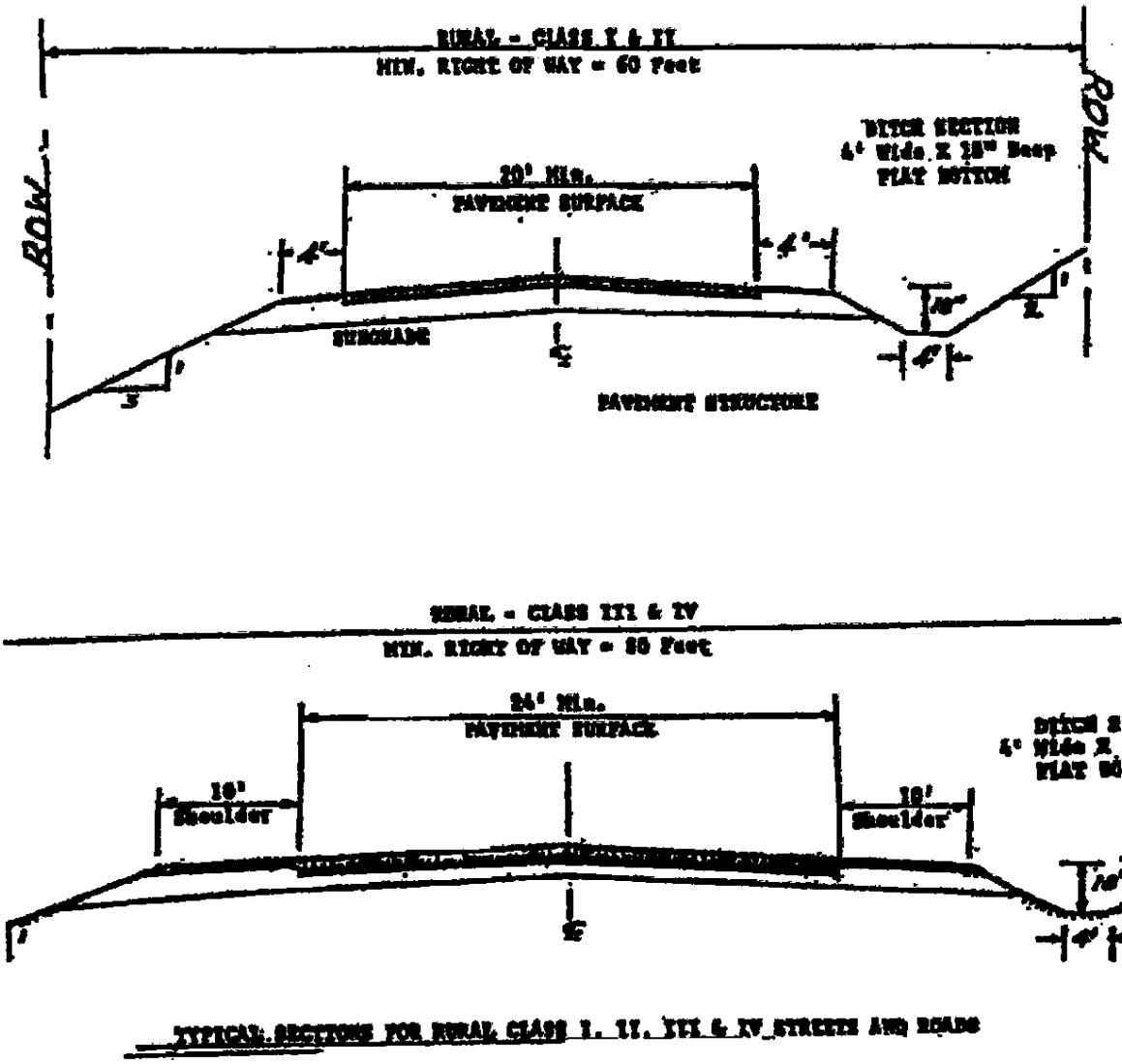
**Curb Section--Figure 7**



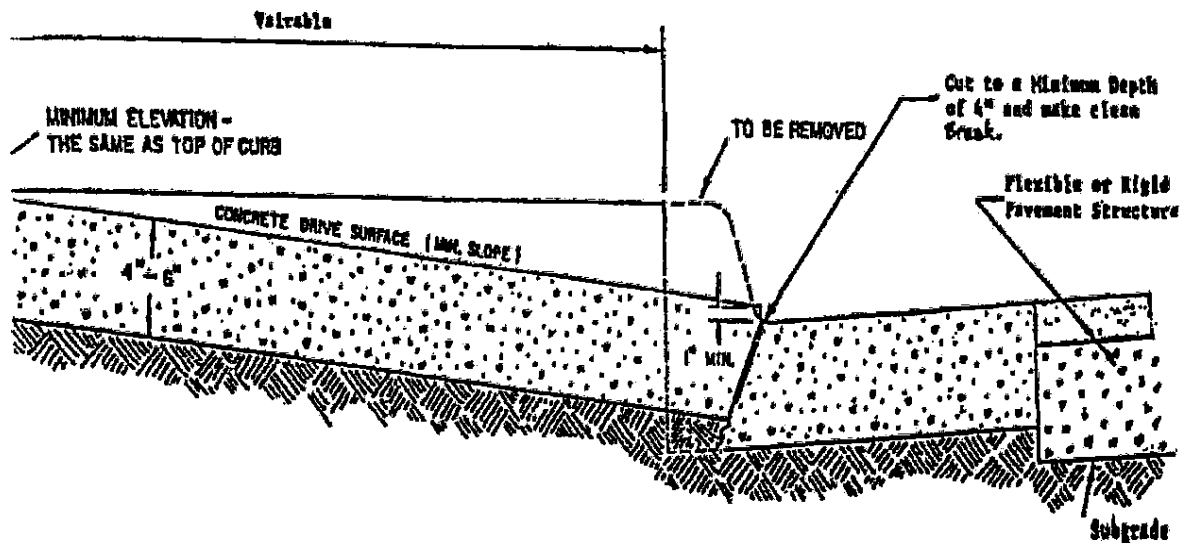
### Typical Section Of Repair For Utility Cuts On Paved County Roads-- Figure 8



### Typical Sections For Rural Class I, II, III, & IV Streets and Roads-- Figure 9



## Typical Driveway Cut--Figure 10



### OPTIONAL CONSTRUCTION METHOD

As alternatives, the entire curb and gutter section for the driveway may be sawed full depth and removed. The curb and gutter section removed shall then be reconstructed as a part of the driveway. The modified curb and gutter must have the shape shown above, and have 1/2\" filled construction joints at each end of the driveway.

**APPENDIX C PRIVATE ROAD DISCLOSURE STATEMENT**

The road named \_\_\_\_\_, located in the subdivision recorded under the name of \_\_\_\_\_, is declared to be privately maintained and is subject to the following:

1. The road is not constructed to an all-weather standard.
2. The maintenance of the road shall be the responsibility of the current and future property owners in the subdivision.
3. The ability of emergency service personnel to respond to an emergency in the subdivision is affected by the condition of the private road. It is strongly recommended that property owners adequately improve and maintain the road to ensure emergency access.

IN TESTIMONY WHEREOF, the developer(s), (Name of developers) has caused this instrument to be signed and (his) (her) (their) seal(s) to be hereto affixed this day of (Date).

(Signature of developer) \_\_\_\_\_

(Signature of developer) \_\_\_\_\_

(Signature of developer) \_\_\_\_\_

**TABLE INSET:**

STATE OF ARKANSAS	)
	) SS
COUNTY OF WASHINGTON	)

I, the undersigned Notary Public in and for the County and State afore said do hereby certify that \_\_\_\_\_ personally appeared before me and acknowledged the due execution of this document.

Witness my hand and seal this day of (Date)

NOTARY PUBLIC

My Commission Expires: \_\_\_\_\_

## APPENDIX D DEFINITIONS

### 1. Definition of terms.

For the purpose of this appendix, certain terms used herein are defined as follows:

*Administrative officer:* The person designated by the County Judge to have overall responsibility of the entire policy or particular portion(s) of the policy.

*Building setback lines:* A line beyond which buildings or structures may be erected.

*Construction plans and specifications:* Detailed design plans and specifications to be used in the construction of streets, curb and gutter, sidewalks, drives, alleys, public utilities, and other improvements.

*Contour intervals:* Topographic map lines connecting points of equal elevations.

*County engineer:* As named by the County Judge.

*County plan:* The Comprehensive Plan of Washington County, whether in whole or in part, as adopted by the Washington County Planning Board, approved by the Quorum Court, and duly recorded in the office of the Circuit Clerk of Washington County.

*County road:* A highway, road or street dedicated for public use and accepted by the County for maintenance. Some roads may not have been formerly dedicated, but have been accepted and maintained by the County for many years and are designated by the County Road Department as County roads.

*County Road Superintendent:* The person designated by the County Judge to have overall responsibility of the County roads.

*Dedication:* Land and improvements offered to the city, County or State and accepted by them for public use, control and maintenance.

*Developer:* A person, firm or corporation undertaking to develop a subdivision or any other type of land development as defined in these regulations.

*Development plan:* A drawing showing all proposed improvements to a piece of property, including, but not limited to, streets, parking lots, buildings, drives, signs, utilities, drainage, grading and planting by size and location.

*Donate:* To give without the exchange of money or other monetary considerations.

*Easement:* A grant by the property owner to the public, a corporation or person, of the use of a strip of land for specific purposes.

*Engineer:* A registered professional engineer in the State of Arkansas.

*Exemption:* A division of land not subject to the requirements specified in the "Regulations, Standards and Specifications for the Division, Development, and Improvement of Unincorporated Land in Washington County, Arkansas", except as specified in this appendix.

*Family member:* Any person who is a natural or legally defined sibling, offspring, spouse, grandchild or parent of the property owner.

*Farm divisions:* (See "Splits." )

**Health department:** The County and State health department.

**Improvements:** Physical changes made to property to prepare it for development, such as but not limited to street grading, drainage structures, street surface, sidewalks, curbs, gutters, utility lines, bridges, buildings and similar items.

**Land:** One or more contiguous parcels under one ownership.

**Land development:** Development including, but not limited to, subdivisions, mobile home parks, mobile home subdivisions, large-scale developments, tract splits, lot splits, streets, roads, bridges, storm drainage systems, water and sanitary sewer systems, off-site improvements, landfills, airports, public utilities, etc. The term land development shall include activities to prepare land for development including but not limited to activities such as grading and clearing; however, development shall not include agricultural activities.

**Land surveyor:** A licensed land surveyor in the State of Arkansas.

**Large-scale development:** The development of a lot or parcel, said parcel being larger than one acre, developed as a single improvement. The term "development" shall include, but not be limited to, the construction of a new improvement, the construction of an addition to an existing improvement, or a parceling which results in the need for access and utilities and shall include installation of an individual or other type of sewer system.

**Lot:** A portion of a subdivision or other parcel of land intended as a unit for transfer of ownership or for development.

**Lot, corner:** A lot of which at least two adjacent sides abut on intersecting streets.

**Mobile home park:** A parcel of land on which two or more mobile homes exist for the purpose of producing income.

**Mobile home subdivision:** The development or division of land into lots or parcels intended as a unit for transfer of ownership.

**Parcel:** An area of land under one ownership.

**Plat, concept:** A generalized sketch of a proposed development containing sufficient information to allow the planning board to assist the developer in complying with these regulations.

**Plat, final:** A complete and accurate plat of proposed land development, prepared for official recording as required by statute, to define property boundaries, street improvements, utilities and other improvements. See section 11-77.

**Plat, preliminary:** A formal plan, drawn to scale, indicating prominent existing features and its surrounding and the layout of the improvements of the proposed land development. See section 11-77.

**Private road:** A privately created and maintained road. Such roads are not accepted by a government entity for maintenance.

**Private road development (PRD):** A development that utilizes, in whole or in part, a private road for access.

*Public road:* A highway, road or street dedicated for public use and/or used by the public generally, but not accepted by a government entity for maintenance. These roads are classified by the County Road Department as "residential drives".

*Replat:* The process of changing a previously approved land development either by alteration of a lot, parcel, or tract, or the placement of another type of development on a lot or tract different from the one previously contemplated when originally approved or by other changes made to the original plat. All replats must go through the planning process as set out in section 11-51 et seq. or may be done administratively if it qualifies for such.

*Right-of-way (ROW):* The land opened, reserved or dedicated for a street, walk, drainage or other public purposes.

*Shared easement:* An easement which connects more than one lot without public road frontage to the public road.

*Street:* A strip of land, including the entire right-of-way, intended primarily as a means of vehicular and pedestrian travel which may also be used to provide space for sewers, public utilities, trees and sidewalks.

*Street classification:* The Washington County Master Street Plan classifies streets and County roads into the following broad categories:

*Alley:* A minor public way dedicated to public use for utility easements and public access to the back or side of properties abutting a street. Alleys are not intended for use as private drives and will not be maintained as such.

*Arterial:* A street or road of considerable continuity which serves or is intended to serve as a principal traffic way between separate areas, districts, communities or densely developed areas; and is the main means of access to the primary street system or expressway.

*Collector:* A street which, in addition to serving abutting properties, intercepts minor streets, connects with community facilities and carries neighborhood traffic to major arterial street systems.

*Dead-end street:* A street having one end open to traffic and being permanently terminated by a vehicular turnaround.

*Private drives and driveways:* A travelway installed and maintained by others and not part of the County road system. They are intended to provide access to and from a residence, lot, parcel of land, apartment complex or other private development approved by the County Planning Board.

*Residential:* Minor streets used primarily to provide access to abutting properties.

*Subdivisions:* The subdivision of land into lots and blocks, the parceling of land resulting in the need for access or utilities, or the dividing of an existing lot or parcel into two (2) or more lots or parcels; a minor subdivision consists of four (4) lots or less.

## 2. Definition of construction terms.

*AASHTO:* American Association of State Highway and Transportation Officials.

*AASHTO T 99 (Standard Proctor)*: Laboratory determination of the maximum density to which a soil can be compacted using a 5.5-pound hammer and a 10-inch drop.

*AASHTO T 180 (Modified Proctor)*: Laboratory determination of the maximum density to which a soil can be compacted using a 10-pound hammer and a 18-inch drop.

*ACHM*: Asphalt concrete hot mix.

*ADT*: Average daily traffic.

*AHTD*: Arkansas Highway and Transportation Department.

*ASTM*: American Society for Testing and Materials.

*DBS*: double bituminous surface treatment (double chip-and-seal).

*EAL*: Equivalent axle load, usually 18 Kip EAL's.

*FHWA*: Federal Highway Administration.

*Kip*: A unit of measure equal to 1,000 pounds.

*LL*: Liquid limit; the moisture content at which a soil passes from a plastic state to a liquid state.

*PL*: Plastic limit; the lowest moisture content at which a soil passes from a dry loose state to a plastic cohesive state.

*PI*: Plastic index; the difference between the liquid limit and the plastic limit of a soil.

*psi*: Pounds per square inch.

(Ord. No. 2005-50, Art. 1, 9-8-05; Ord. No. 2006-42, Art. 1, 7-13-06; Ord. No. 2006-75, Art. 1, 12-14-06; Ord. No. 2007-01, Art. 1, 1-8-07)

## APPENDIX E SIGNATURE BLOCKS

The following signatures shall appear on each final plat; if the plat (or any portion of the plat) is located within a City's Planned Growth area, please check with the applicable city and provide whatever signature blocks they may require in addition to the below blocks.

1. CERTIFICATE OF ACCURACY OF STREET AND ROAD PLANS AND SPECIFICATIONS:

I certify that the street and road plans and specifications hereon comply with the requirements and specifications contained in the "Regulations, Standards and Specifications for the Division, Development and Improvement of Unincorporated Land in Washington County".

Date: \_\_\_\_\_

Engineer: \_\_\_\_\_

2. CERTIFICATE OF ACCURACY OF SURVEY:

I certify that the plan shown and described hereon is a true and correct survey and that the monuments have been placed as shown hereon as required by "Regulations, Standards and Specifications for the Division, Development and Improvement of Unincorporated Land in Washington County".

Date: \_\_\_\_\_

Surveyor: \_\_\_\_\_

3. CERTIFICATE OF OWNERSHIP AND DEDICATION:

I hereon certify that I am the owner of the property described hereon and I do hereby dedicate all street, access, utility, and drainage easements to public or private use as indicated.

Date: \_\_\_\_\_

Owner: \_\_\_\_\_

4. STATE HEALTH DEPARTMENT APPROVAL:

The plan and specifications as shown on the plat were approved by the Arkansas State Health Department by letter.

Dated: \_\_\_\_\_

Signed By: \_\_\_\_\_

**5. UTILITY EASEMENTS:**

We hereby certify that all utility easements shown on this plat are satisfactory for providing service if and when service is available.

Gas: \_\_\_\_\_

Electricity: \_\_\_\_\_

Water: \_\_\_\_\_

Telephone: \_\_\_\_\_

Cable TV: \_\_\_\_\_

**6. DECLARATIONS OF COVENANTS AND RESTRICTIONS (if applicable):**

Covenants and restrictions are as shown on the appropriate document signed by the owner on \_\_\_\_\_, and filed with the Circuit Clerk on \_\_\_\_\_.

Date: \_\_\_\_\_

Owner: \_\_\_\_\_

**7. COUNTY ROAD SUPERINTENDENT APPROVAL: (Use block 7a or 7b as appropriate, but not both.)**

7a. The road and easement locations shown on this Plat, the road plans submitted, and the grading and drainage plans submitted are approved. The required maintenance bonds have been received.

County Road Superintendent: \_\_\_\_\_

Date: \_\_\_\_\_

7b. The road easements shown are approved.

County Road Superintendent: \_\_\_\_\_

Date: \_\_\_\_\_

8. **PLANNING BOARD APPROVAL:** (Use block 8a if in a city planning area and block 8b if not.)

8a. This plat lies within the planning jurisdiction of the City of \_\_\_\_\_ . The plans for ingress and egress shown on this plat were approved by the Washington County Planning Board at a meeting held on (date) \_\_\_\_\_ .

Planning Director: \_\_\_\_\_

Date: \_\_\_\_\_

8b. This plat was approved by the Washington County Planning Board at a meeting on (date) \_\_\_\_\_ .

Planning Director: \_\_\_\_\_

Date: \_\_\_\_\_

9. **COUNTY FIRE MARSHAL APPROVAL:**

This plat meets minimum fire code requirements as per current County Policy, as of June 9, 2005.

County Fire Marshal: \_\_\_\_\_

Date: \_\_\_\_\_

10. **PUBLIC UTILITY COORDINATOR APPROVAL:** (Applicable when a community sewer system is being utilized.)

This subdivision is in compliance with County Ordinances regarding Community Sewer Systems.

Public Utility Coordinator: \_\_\_\_\_

Date: \_\_\_\_\_

(Note: Less signatures may be required in certain instances. Check with the Planning Administrator to see which signatures are necessary if the land development has four (4) plats or less, no road improvements, or is an exempt split.)

11. **COUNTY JUDGE APPROVAL:**

The road easement dedications shown are approved. Acceptance of roads and streets into the County Road System will occur after they are constructed to Washington County Specifications.

County Judge: \_\_\_\_\_

Date: \_\_\_\_\_

(Ord. No. 2006-33, Art. 1, 6-8-06; Ord. No. 2006-65, Art. 1, 11-9-06)