

ARTICLE IV
STREETS AND SIDEWALKS STANDARDS

Section 401 Streets – General Requirements

401.1 The functional classification, location, and rights-of-way and pavement widths of all streets shall conform to the *City of Branson West Comprehensive Plan* and the *Branson West Subdivision Regulations*. In any case where additional street right-of-way is required, the additional right-of-way shall be split on both sides of the existing right-of-way unless otherwise approved by the Board of Aldermen.

Where not shown, the arrangement and design standards of streets shall conform to the provisions herein and/or the Missouri Department of Transportation where applicable. Streets which have an entry onto a state highway will require approval from the Missouri Department of Transportation. Streets which have an entry onto a Stone County roadway will require County approval.

401.2 The arrangement of streets in new subdivisions shall be coordinated with existing, proposed and anticipated streets outside of the subdivision. Provision shall be made for the continuation of existing streets in adjoining areas.

401.3 When a new subdivision adjoins a tract susceptible to being subdivided, new streets shall be extended to the boundaries of such tract.

401.4 Streets shall be related appropriately to the topography and street grades shall conform as closely as practical to the original topography. Street grades shall be in accordance with the requirements of this Ordinance.

401.5 Street jogs with centerline offsets of less than 150 feet shall be prohibited.

401.6 Local streets shall be designed to discourage through traffic. However, provisions must be made for the extension of arterial and collector streets into and from adjoining areas.

401.7 Permanent dead-end streets or culs-de-sac shall be no longer than 800 feet and shall provide at the closed end a paved turn-around having a minimum diameter of eighty (80) feet to the face of the outside curb or pavement and one hundred (100) feet to the street right-of-way line.

401.8 Any street dead-ended for access to an adjoining property, or temporary in nature because of authorized staged development, shall be provided with temporary, all-weather turn-around at the end of the street and the use of such turn-around shall be guaranteed to the public until such time as the street is extended.

Every lot shall have access to a road that provides reasonable ingress and egress for emergency vehicles as well as for the intended use of the lot.

401.9 When a subdivision abuts or contains an arterial street or state highway, the City may require marginal access streets, reverse frontage lots, or other such treatment as may be necessary for adequate protection of abutting properties and to provide separation of through and local traffic.

401.10 Half-streets shall be prohibited except where such streets, when combined with a similar street (developed previously or simultaneously) on property adjacent to the subdivision, create a street that meets the right-of-way and pavement requirements of the *City of Branson West Subdivision Regulations* and this Ordinance. In such case, the developer shall dedicate that portion of land in the proposed subdivision that will complete the street right-of-way to the minimum standards.

Section 402 Street Standards

402.1 Clearing and Grubbing

Clearing and grubbing shall be performed within the right-of-way and easement limits shown on the plans. All timber, brush, roots, stumps, trees or other vegetation cut during the clearing operations shall become the contractor's responsibility to dispose of, and shall be either removed from the project site, or satisfactorily disposed of on-site.

402.2 Grading and Compaction

Streets shall be graded in accordance with the lines and grade set by the Engineer. Before placing curb and gutter or base on the graded subgrade, the sub grade shall be compacted to ninety-five percent (95%) Standard Proctor for a depth of eight (8) inches and then shall be proof rolled with a fully loaded pump truck in the presence of the Engineer. Places that are found to be loose, or soft, or composed of unsuitable materials, whether in the sub grade or below it, must be dug out and refilled with compacted crushed limestone base rock conforming to MoDOT 304 Type I stone. All embankments or fills shall be made in eight (8) inch horizontal lifts of suitable material. The fill shall be rolled with a sheepsfoot roller after each lift, followed by a wheel roller, each weighing not less than eight (8) tons.

402.3 Street Construction

A. Arterial and Collector Streets

All arterial and collector streets designed, extended, installed or developed within the City shall meet the City requirements for construction of said streets and shall, at a minimum, be constructed with four (4) inches of wet compacted limestone base, conforming to Missouri Department of Transportation (MoDOT) 304 Type I stone. The contractor shall be responsible for keeping the stone base free of contamination from clay or other foreign materials. An eight (8) inch compacted asphalt base course shall meet MoDOT 301 specifications, and a two (2) inch compacted asphalt surface course shall meet MoDOT specifications for Type 401-BP2 asphalt.

B. Other Streets

All other streets designed, extended, installed or developed within the City shall meet the City requirements for construction of said streets and shall, at a minimum, be constructed with four (4) inches of wet compacted limestone base, conforming to Missouri Department of Transportation (MoDOT) 304 Type I stone. The contractor shall be responsible for keeping the stone base free of contamination from clay or other foreign materials. A five (5) inch compacted asphalt base course shall meet MoDOT 301 specifications, and a two (2) inch compacted asphalt surface course shall meet MoDOT specifications for Type 401-BP2 asphalt.

C. Installation and Testing

All sub-grade, crushed limestone, asphalt base course and asphalt surface course shall be installed and tested in accordance with Stone County and MoDOT requirements. Tests shall be performed at a minimum rate of one (1) per one hundred (100) lineal feet of roadway or a minimum of two tests per day, whichever is more frequent.

402.4 Pavement Section Variations

Where soils are unstable, as determined by the testing agency selected by the City, the developer may be required to have soil tests run and a pavement design made by a qualified soils engineer.

402.5 Curb and Gutter

All streets shall be constructed with concrete curb and gutter, except for local residential streets serving single family subdivisions or single family residential lots of one acre or greater which may be constructed with ditch drainage. Where ditch drainage is proposed, the subdivider may be required to install curb and gutter or other structural drainage facilities at locations specified by the City to insure flow of storm water from one drainage conveyance system to a different system. Concrete curb and gutter shall be constructed according to the lines and grades established by the City Engineer. The concrete shall meet MoDOT requirements. The curb and gutter shall be thirty (30) inches wide, and shall have a vertical curb face. Curb and gutter shall be installed in conformance with Drawings No. 18 and No. 19 and City specifications for said improvements.

402.6 Cut and Fill Slopes

Cut and fill slopes shall not exceed $\frac{1}{4}$ inch per foot from the edge of the street pavement or curb back to the street right-of-way line.

It is preferred that most slopes adjoining rights-of-way should be sloped no steeper than a 3:1 grade.

402.7 Street Grades

The minimum grade at any point on any street shall be one-half of one percent (0.5%). Unless a greater grade is approved by the City, the maximum grade shall be twelve percent (12%). However, in no case shall streets be constructed with grades that create a substantial danger to the public safety.

402.8 Street Intersections

- A. Intersections involving the junction of more than two (2) streets shall be prohibited.
- B. Streets shall intersect as nearly as possible at right angles. The angle of intersection of street centerlines shall not be less than seventy-five (75) degrees.
- C. Except where no other alternative is practical or legally possible, no two (2) streets may intersect with any other street on the same side at a distance of less than four-hundred (400) feet measured from centerline to centerline of the intersecting street. When the intersected street is an arterial, the distance between intersecting streets shall be at least six-hundred (600) feet.

- D. Street curb intersections shall be rounded by a tangential arc with a minimum radius of twenty-six (26) feet for intersections of two (2) minor streets and thirty (30) feet for intersections involving collector or arterial streets. Where substantial use is anticipated by large vehicles, such as recreational vehicles or semi-trailers, the curb radius shall be increased to accommodate the anticipated use.
- E. Design Speed, Sight Distance, Centerline Radius

Design Speed, Sight Distance, Centerline Radius		
	Local Streets	Collector & Arterial Streets
Design Speed	25 mph	30 mph
Minimum Sight Distance on Vertical Curve	100 feet	200 feet
Minimum Centerline Radius	100 feet	200 feet

402.9 Sight Distances at Intersections

- A. At no-stop intersections, the intersection shall be constructed so that a person standing at a location on the centerline of any street ninety (90) feet from the intersection of the street centerlines has an unobstructed view to a point located on the centerline of the intersecting street ninety (90) feet (in either direction) from the intersection of the street centerlines. See Standard Drawing No. 20.
- B. At stop intersections the intersection shall be constructed so that a person standing ten (10) feet back of the intersection right-of-way lines on the stop street has an unobstructed view to a point on the right-of-way line of the intersecting through street located seventy (70) feet from the intersection of the right-of-way lines. See Standard Drawing No. 21.
- C. At street connections to primary state roads the intersection shall be constructed so that a person standing thirty (30) feet back of the intersection right-of-way lines on the stop street has an unobstructed view to a point on the right-of-way line of the intersecting through street located one hundred fifty (150) feet from the intersection of the right-of-way lines. See Standard Drawing No. 22.

Section 403 Driveway Approaches

- 403.1 All driveway entrances and other openings onto streets within the City’s planning jurisdiction shall be constructed so that:
- A. Vehicles can enter and exit from the lot in question without posing any substantial danger to themselves, pedestrians or vehicles traveling on abutting streets.
 - B. Interference with the free and convenient flow of traffic on abutting or surrounding streets is minimized.
- 403.2 Driveway approach wings shall be a minimum of four (4) feet, with two (2) feet on each side of the driveway. Driveway approach base shall be four (4) inches of 5/8 inch rock or equivalent and subgrade shall be compacted to ninety-five percent (95%) Standard Proctor ASTM D698. Driveway approaches shall be constructed of Portland concrete and shall be six (6) inches thick.
- 403.3 Where drainage culverts are required, all driveway entrances and other openings onto streets shall be constructed so that:
- A. The culvert is at least twelve (12) inches in diameter, with a minimum of six (6) inches of surface cover over the culvert or as determined by the City. Larger sizes may be required as determined by the City.
 - B. The construction of the driveway surface over the culvert shall be level with the top of the curve to maintain storm water in the street.
- 403.4 The size of culverts under City streets shall be approved by the City and shall be constructed of reinforced concrete pipe.

Section 404 Sidewalks

- 404.1 Sidewalks shall be constructed on both sides of collector and arterial streets.
- 404.2 Sidewalks shall be located within the street right-of-way, one (1) foot inside the right-of-way line. Sidewalk subgrade shall be compacted to ninety-five percent (95%) standard proctor ASTM D698. Sidewalks shall be constructed of Portland concrete and shall be four (4) inches thick. Expansion joints shall be provided every fifty (50) feet; contraction joints at five (5) feet. Sidewalk widths shall be constructed to the following applicable minimum standard:
- A. Sidewalks shall be a minimum of four (4) feet wide.

- B. Sidewalks along collector and arterial streets that provide access to schools, recreation areas and other community facilities shall be a minimum of five (5) feet wide.
- 404.3 Whenever the Board of Aldermen finds that a means of pedestrian access is necessary from the subdivision to schools, parks, playgrounds, or other roads or facilities and that such access is not conveniently provided by sidewalks adjacent to the streets, the developer may be required to construct other walkway improvements to provide such access, in compliance with the requirements of the *City of Branson West Subdivision Regulations, Article VIII, Required Public Improvements*.
- 404.4 All sidewalks shall be constructed up to each intersecting street and wheelchair ramps shall be provided at intersections and other major points of pedestrian flow. Where required, wheel chair ramps and depressed curbs shall be constructed in accordance with the standards of the Americans With Disabilities Act in effect at the time of construction.
- 404.5 A grass planting strip shall be provided between the curb and the sidewalk.

Section 405 Installation of Improvements in Street Right-of-Way

All utilities and improvements that are to be installed in street rights-of-way shall be completed prior to construction of the street.

Section 406 Quality Assurance

- 406.1 All sub-grade, crushed limestone, bituminous plant mix base and bituminous plant mix surface of all streets shall be installed and tested according to the requirements of Stone County and the Missouri Department of Transportation. Tests shall be performed at a minimum rate of one (1) per one-hundred (100) lineal feet of roadway or a minimum of two tests per day, whichever is more frequent. The City shall select the location of these tests.
- 406.2 Meeting these standards and the tests referred to in Section 406.1 shall be the responsibility and at the exclusive cost of the developer. The City shall employ the testing agency and the developer shall pay the costs.
- 406.3 If any of the said tests are returned to the City showing a failure by the developer to meet or surpass the standards established, then the developer shall take such remedial measures as may be required by the City.
- 406.4 The developer shall give the City at least twenty four (24) hours notice prior to commencing the installation.

406.5 Project Conditions

- A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp or if the following conditions are not met:
 - 1. Prime and Tack Coats: Minimum surface temperature of 60° F (15.5° C).
 - 2. Asphalt Base Course: Minimum surface temperature of 40° F (4° C) and rising at time of placement.
 - 3. Asphalt Surface Course: Minimum surface temperature of 60° F (15.5° C) at time of placement
- B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40° F (4° C) for oil-based materials, 50° F (10° C) for water-based materials, and not exceeding 95° F (35° C).

406.6 Examination

- A. Verify that subgrade is dry and in suitable condition to support paving and imposed loads.
- B. Proof-roll subbase using heavy, pneumatic-tired rollers to locate areas that are unstable or that require further compaction.
- C. Proceed with paving only after unsatisfactory conditions have been corrected.

406.7 Repairs

- A. Leveling Course: Install and compact leveling course consisting of hot-mix asphalt surface course to level sags and fill depressions deeper than one (1) inch (25 mm) in existing pavements.
 - 1. Install leveling wedges in compacted lifts not exceeding three (3) inches (75 mm) thick.
- B. Crack and Joint Filling: Remove existing joint filler material from cracks or joints to a depth of ¼ inch (6 mm).
 - 1. Clean cracks and joints in existing hot-mix asphalt pavement.
 - 2. Use emulsified-asphalt slurry to seal cracks and joints less than ¼ inch (6 mm) wide. Fill flush with surface of existing pavement and remove excess.

3. Use hot-applied joint sealant to seal cracks and joints more than ¼ inch (6 mm) wide. Fill flush with surface of existing pavement and remove excess.

406.8 Surface Preparation

- A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.
 1. Sweep loose granular particles from surface of unbound-aggregate base course. Do not dislodge or disturb aggregate embedded in compacted surface of base course.
 2. Mix herbicide with prime coat if formulated by manufacturer for that purpose.
- B. Prime Coat: Apply uniformly over surface of compacted unbound-aggregate base course at a rate of 0.15 to 0.50 gal./sq. yd. (0.7 to 2.3 L/sq. m). Apply enough material to penetrate and seal but not flood surface. Allow prime coat to cure for 72 hours minimum.
 1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
 2. Protect primed substrate from damage until ready to receive paving.
- C. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd. (0.2 to 0.7 L/sq. m).
 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
 2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

406.9 Hot-Mix Asphalt Placing

- A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.

1. Place hot-mix asphalt base course in number of lifts and thicknesses indicated.
 2. Place hot-mix asphalt surface course in single lift.
 3. Spread mix at minimum temperature of 250° F (121° C).
 4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes, unless otherwise indicated.
 5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.
- B. Place paving in consecutive strips not less than ten (10) feet (3 m) wide unless infill edge strips of a lesser width are required.
1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete a section of asphalt base course before placing asphalt surface course.
- C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

406.10 Joints

- A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions with same texture and smoothness as other sections of hot-mix asphalt course.
1. Clean contact surfaces and apply tack coat to joints.
 2. Offset longitudinal joints, in successive courses, a minimum of six (6) inches (150 mm).
 3. Offset transverse joints, in successive courses, a minimum of twenty-four (24) inches (600 mm).
 4. Construct transverse joints as described in AI MS-22, “Construction of Hot Mix Asphalt Pavements.”
 5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
 6. Compact asphalt at joints to a density within two (2) percent of specified course density.

406.11 Compaction

- A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or vibratory-plate compactors in areas inaccessible to rollers. Complete compaction before mix temperature cools to 185° F (85° C).
- B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct lay down and rolling operations to comply with requirements.
- C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:

Average Density: 96 percent of reference laboratory density according to AASHTO T 245, but not less than 94 percent nor greater than 100 percent.
- D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.
- E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.
- F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.
- G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

406.12 Installation Tolerances

- A. Thickness: Compact each course to produce the thickness indicated within the following tolerances:
 - 1. Base Course: Plus or minus ½ inch (13 mm).
 - 2. Surface Course: Plus ¼ inch (6 mm), no minus.

- B. Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot (3-m) straightedge applied transversely or longitudinally to paved areas:
 - 1. Base Course: ¼ inch.
 - 2. Surface Course: 1/8 inch.
 - 3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is ¼ inch.

406.13 Field Quality Control

- A. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.
- B. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.
- C. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement according to ASTM D 979 or AASHTO T 168.
 - 1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.
 - 2. In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.
 - a. One core sample will be taken for every 1000 sq. yd. (836 sq. m) or less of installed pavement, with no fewer than three (3) cores taken.
 - b. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726.
- F. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.