

SECTION 5200 - STREETS
CITY OF BELTON, MISSOURI
DESIGN CRITERIA

The City of Belton hereby adopts Section 5200 of the Kansas City Metropolitan Chapter of APWA Construction and Material Specifications, current edition. The following additions supersede any discrepancies with APWA Section 5200 for use within Belton.

1. *Relationship to adjoining street systems.* The arrangement of streets in new subdivisions shall make provisions for the continuation of the principal existing streets in adjoining additions (or their proper projection where adjoining property is not subdivided) insofar as they may be necessary for public requirements. The width of such streets in new subdivisions shall be not less than the minimum street widths established herein. Alleys, when required, and street arrangement must cause no hardship to owners of adjoining property when they plat their land and seek to provide for convenient access to it. Whenever there exists a dedicated or platted half street or alley adjacent to the tract to be subdivided, the other half of the street or alley shall be platted and dedicated as a public way.
2. *Street names.* Streets that are obviously in alignment with other already existing and named streets shall bear the names of the existing streets.
3. *Arterial streets.* Arterial streets through subdivisions shall conform to the major street plan of the comprehensive plan as adopted by the planning commission. The number of intersections and private vehicular access points (curb cuts) along arterial streets shall be held to a minimum and each limitation may be placed on the face of the plat. Whenever practical, the distance between intersections shall not be less than 1,320 feet (0.23 mile).
4. *Collector streets.* Wherever possible, collector streets on either side of an arterial street shall be offset by at least 600 feet (measured centerline to centerline).
5. *Local streets.* Local streets should be designed so as to discourage through or non-local traffic. Local streets should not intersect arterial streets. Offset local streets shall be at least 125 feet apart (measured centerline to centerline).
6. *Cul-de-sacs.* An adequate turnaround of not less than a 40-foot radius to back of curb and a 100-foot diameter right-of-way shall be provided at the closed end of a dead-end local street longer than one lot in length. If such cul-de-sac is not to be provided with curb and gutter, the turnaround right-of-way shall not be less than a 120-foot diameter. Such local street segment shall not exceed 500 feet in length from the centerline of an intersection of a cross street to the center of the cul-de-sac. If a cul-de-sac or dead-end street is temporary in that it is planned to connect to another street at a later date, the planning commission may allow for such streets with a length of 1,320 feet.
7. *Sewer and water work before base construction.* No base course work may proceed on any street until all trenching for storm and sanitary sewers and for water lines within an area extending one foot behind curbs has been properly backfilled satisfactory to the director of public works. Wherever

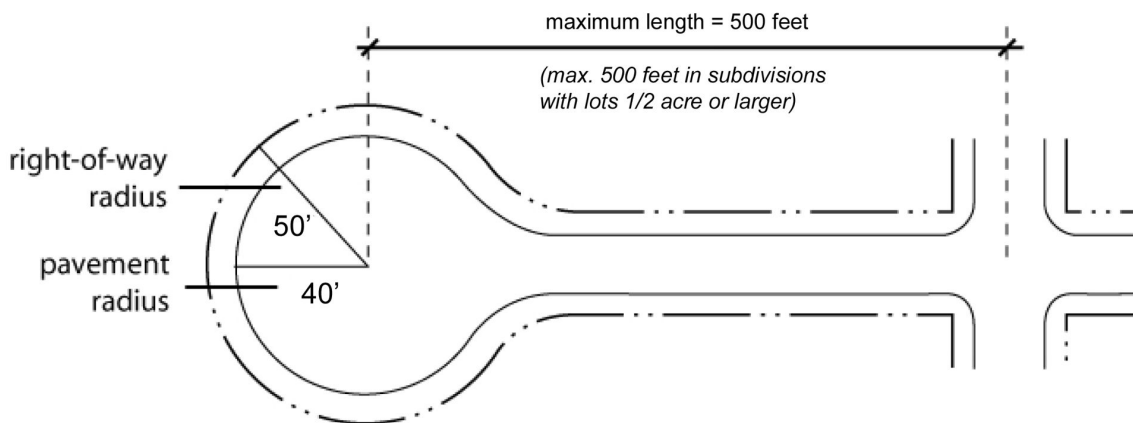
possible, the developer must schedule installation of gas or buried electric utility lines so that trenches for such lines can be properly backfilled before street base course construction.

8. *Storm sewers and inlets.* Manholes, storm sewers, inlets and utility valves shall be adjusted to meet the proper grade of street or yard areas to the satisfaction of the director of public works.

9. *Cul-de-sac streets.*

(1) Cul-de-sac streets may not be longer than 500 feet, measured from the centerline of the cul-de-sac to the centerline of the connecting street. Exceptions may be made where topographic or other unusual existing conditions so require, subject to the approval of the director of public works; fire marshal and planning commission.

(2) Turnarounds must have a minimum pavement radius of 40 feet and a minimum outside property line radius of 50 feet.



(3) A decorative island may be provided at the center of a cul-de-sac turnaround if the director of public works and fire marshal determines that its installation would not impede traffic or create unsafe conditions. Decorative islands must be specifically approved by city council. As a condition of approval, the developer must assign responsibility for maintenance of the island to the homeowner's association, and related provisions of the property owners' association articles of agreement must be reviewed and approved by the city council prior to final plat approval.

10. *Right-angle intersections.* Under normal conditions, streets shall be laid out to intersect, as nearly as possible, at right angles. Where topography or other conditions justify a variation from the right-angle intersection, the minimum angle shall be 60 degrees.

11. *Streets adjacent to a railroad right-of-way, limited access road, principal highway or arterial street.* Where lots front or side, but do not back on railroad rights-of-way, limited access roads, or principal highways or arterial streets, a marginal access street or frontage road may be required parallel and adjacent to the boundary of such rights-of-way. The distance from said rights-of-way shall be determined, with due consideration to minimum distance required for approach connections to future grade-separated intersections.

12. *Half-streets.* Half-streets and half rights-of-way shall be prohibited, except where no lots front on such half-street.

13. *Alleys.* Alleys may be required in commercial, industrial, and residential areas. Dead-end alleys shall be avoided, wherever possible; but if unavoidable, such alleys shall be provided with adequate turnaround facilities at the dead-end. Alleys should be avoided in residential areas except where alleys of adjoining subdivisions would be closed or shut-off by failing to provide alleys in the adjoining subdivision.

14. *Minimum requirements.* The right-of-way grades and widths for streets and alleys, dedicated and accepted, shall conform to the designation in the comprehensive plan and shall not be less than the minimum for each classification as follows:

	Minimum Right-of-Way Width	Maximum Grade
Major streets:		
Major arterials	120 - 150 feet	6%
Minor arterials	100 feet	7%
Collector streets:		
Industrial and commercial collector	80 feet	6%
Residential collector	70 feet	6%
Local streets:		
Residential local	60 feet	10%
Cul-de-sacs	100 feet diameter	
Marginal access streets or frontage roads:		
Two-way	50 feet	10%
One-way	50 feet	10%
Alleys	20 feet	10%
Pedestrian ways	10 feet	

When existing or anticipated traffic on arterial and collector streets warrants greater widths of rights-of-way, the additional width shall be dedicated. The minimum gradient shall be one percent.

15. *Street alignment.* Minimum horizontal and vertical alignment on all streets, except in unusual cases, shall be as follows:

a. Minimum horizontal-radii at the centerline:

Major arterial	1,091 feet
Minor arterial	700 feet
Industrial/commercial collector	500 feet
Residential collector	380 feet
Residential local	200 feet

b. Minimum sight distance on vertical curves:

Major arterial	475 feet
Minor arterial	350 feet
Industrial/commercial collector	300 feet
Residential collector	300 feet
Residential local	200 feet

19. *Street curvature.* On residential local streets, no tangent length shall be required between reverse curves. For all other streets, a minimum tangent length of 100 feet is required.

20. *Street layout.* Proposed streets shall conform to topography as nearly as possible to reduce drainage problems and grades.

21. *Street lighting.* The design of all publicly-financed or privately-financed street lighting systems to be installed in the public street right-of-way or of major and minor arterial roadways shall conform to the City's Supplemental Specification Section 5800. The developer shall agree to pay all costs of installation and all costs incurred by the city for said street lights for a period of five years.

The poles shall be metal and all electric lines shall be tunneled underground. The final layout shall be reviewed by the Engineering Division of the City for conflicts and location within easements. Any additional easements shall be acquired and recorded by KCP&L.

22. *Street pavement types.*

Street Classification	Pavement Types	
	Option 1	Option 2
Major arterial	9" minimum Portland cement concrete pavement	2" Type 3 asphalt concrete surface
	6" minimum crushed aggregate base course	10" minimum Type 1 asphalt concrete base course
		9" minimum fly ash treated subgrade
Industrial collector and minor arterial	8" minimum Portland cement concrete pavement	2" Type 3 asphalt concrete surface
	6" minimum crushed aggregate	9" minimum Type 1 asphalt

	base course	concrete base course
		9" minimum fly ash treated subgrade
Commercial collector	7" minimum Portland cement concrete pavement	2" Type 3 asphalt concrete surface
	6" minimum crushed aggregate base course	7" minimum Type 1 asphalt concrete base course
		9" minimum fly ash treated subgrade
Residential access, residential local, and residential collector	6" minimum Portland cement concrete pavement	2" Type 3 asphalt concrete surface
	6" minimum crushed aggregate base course	6" minimum Type 1 asphalt concrete base course
		9" minimum fly ash treated subgrade

General Notes:

1. The pavement thicknesses shown are recommended minimums. The actual pavement design thickness should be determined by an engineering analysis of the traffic and local subgrade conditions. The city reserves the right to require additional pavement thickness if conditions warrant.
2. Concrete as part of any and all pavement types shall conform to the specifications of the Kansas City Metro Materials Board (KCMMB) 4k mix. Mix designs shall be approved KCMMB mixes.
3. Other pavement, subgrade, and subbase type options may be considered if submitted to the City of Belton for approval along with an engineering analysis and/or geotechnical report.
4. Concrete pavement joint detail shall be submitted to the City of Belton for approval.
5. Geogrid is not required for use with the recommendations in this table. If used at the designer's option or per recommendation of geotechnical report, Geogrid shall be Tensar BX1100 or approved equivalent.

23. The minimum requirements consist of subgrade stabilization including fly ash treated subgrade as specified in the City's Supplemental Section 2200 – Paving.

24. The developer or contractor shall furnish a soils analysis and geotechnical report of the existing subgrade properties, including Atterberg limits, soil classification (Unified Soil Classification System), moisture-density relationship, and moisture content. The geotechnical report shall include an engineering analysis and recommendation of subgrade stabilization, subbase type options, and pavement that meets, exceeds, or is equivalent to the minimum requirements as specified in Item 22 - Street pavement types.

25. The City Engineer may require other generally accepted methods and materials for street and subgrade construction based on site specific or unique conditions. In the event of high water moisture content, known wet weather spring areas, areas near creeks, etc., the City Engineer may require an APWA drainable base and/or geocomposite underdrain that is connected to storm sewer inlets.
26. When requested by the City Engineer, the contractor shall furnish material test results during construction from an approved testing laboratory in accordance with sampling and testing frequency charts for the city as specified in Item 22 – Street pavement types. Tests of materials shall be taken at the frequency established in the sampling and testing frequency chart.
27. The contractor shall select the testing laboratory and pay for all sampling and testing deemed necessary by the City Engineer, subject to approval of the testing laboratory by the City Engineer. In the event that any test indicates non-compliance, additional testing will be paid for by the contractor to determine acceptability of the material or methods. The City Engineer shall be provided with documentation of all tests, showing compliance, prior to acceptance of the construction. Each test report shall be certified by a qualified person accredited by the American Association of State Highway and Transportation Officials (AASHTO), the American Association for Laboratory Accreditation (A2LA), the American Society of Testing Materials (ASTM), or the Missouri Department of Transportation (MoDOT) in the test being performed.
28. Test reports shall be prepared in at least three copies and shall be distributed directly by the testing agency to the City Engineer, contractor, and the owner.
29. The contractor shall notify the Public Works Inspector a minimum of 24 hours in advance of construction of any utility within city right-of-way, placement of any concrete curb and gutter or commencement of any paving operations. During the construction of all utilities, streets, roads and alleys within the jurisdiction of the city, inspections shall be made by the public works inspector during the following phases of construction:
 - a. Pre-construction to discuss proposed work and city requirements;
 - b. Excavation or boring for any utility construction;
 - c. Prior to any back-fill operations of utility construction;
 - d. General subgrade preparation for a street;
 - e. Curb stringline, and final subgrade, for curb and gutter;
 - f. Placement of the concrete curb and gutter;
 - g. Subgrade prior to paving the first lift of asphalt;
 - h. During the paving operations for the first lift of asphalt:
 - i. Condition of the exposed lift of asphalt prior to paving any additional asphalt lifts, including intermediate courses, wedge courses, or surface course;
 - ii. During paving operations for all asphalt intermediate courses, wedge courses and surface course;
 - iii. Final completion of the project, including back-filling, grading, clean-up and all right-of-way restoration activities.

Other inspections may be made as deemed necessary by the City Engineer. Approval of the work by the public works inspector shall give the contractor the right to proceed with the

succeeding operations, but shall in no way indicate complete approval of prior work if later inspection discloses any deficiency in the prior inspections. Any inspection conducted shall not relieve the contractor from any obligation to perform the work in accordance with the approved plans. Any of the work not so constructed shall be removed and replaced according to the plans.

30. Connectivity

- a. Proposed streets must extend to the boundary line of the tract being subdivided unless prevented by topography or other physical conditions; or unless in the opinion of the planning commission such extension is not necessary or desirable for the coordination of the layout of the subdivision or for the advantageous development of the adjacent tracts.
- b. Streets within new subdivisions shall be connected with existing streets in adjacent subdivisions to provide connectivity between subdivisions.

END OF SECTION