

Article X: Subdivision Design Standards²³

§ 25-37. Purpose. (New)

The purpose of this article is to further the purpose of this code and additionally, to:

- (a) Establish standard requirements, conditions, and procedures for the design and review of subdivisions;
- (b) Provide for the orderly subdivision of land;
- (c) Encourage the wise use and management of land and natural resources throughout the City;
- (d) Ensure that adequate public infrastructure, facilities, utilities, and services are available concurrent with development and that they are designed in a manner that supports the future needs of the systems; and
- (e) Encourage a beneficial relationship between the uses of land and circulation of traffic throughout the City, and to provide for the proper location and design of streets.

§ 25-38. Applicability. (New)

- (a) The provisions of this article shall apply to all subdivision of land.
- (b) The provisions of this article shall also apply to the installation of any public improvements whether the subdivision of land is occurring simultaneously or not. Where public improvements are proposed outside of the subdivision review process, the applicant shall be required to submit improvement plans for review, approval, and dedication in accordance with Section <> (Major Subdivision) without having to submit preliminary or final plats.
- (c) The provisions of this article shall be held to be the minimum requirements necessary in the subdivision of land and installation of public improvements and shall not be waived unless approved through the subdivision modification process in Section <>.

§ 25-39. Conformity to Plans, Zoning, and Engineering Standards. (Revised B-800)²⁴

- (a) The general arrangement and character of lots, blocks, streets, sidewalks, trails, and other public improvements should be consistent with the recommendations of the City of Kirkwood Comprehensive Plan, the Downtown Master Plan and Parking Study, the City of Kirkwood Pedestrian and Bicycle Plan, and any other adopted plans and policies related to the subdivision and development of land.

²³ Street tree and planting requirements will be addressed in the landscaping article.

²⁴ All cross-references to engineering standards and all technical specifications in this article, technical questions, etc. are subject to further refinement after additional review by the new City Engineer.

- (b) Any plans or documents submitted for the subdivision of land or installation of public improvements shall comply with the requirements of this article and any other policies or procedures promulgated by the City Engineer regarding the construction of public improvements.²⁵
- (c) Improvements shall be constructed in accordance with the standard specifications of the Department of Highways and Traffic of St. Louis County, Missouri, except as amended in this code.
- (d) The construction standards may be modified when the modification at least equals the specific construction requirement, meets the intent of the construction standard, provides the City with a superior product, and/or incorporates the latest construction standards/practices of the St. Louis County Department of Highways and Traffic and the modification is approved, in writing, by the Director of Public Services.

§ 25-40. Installation of Public Improvements. (New)

- (a) Public improvements shall be provided by the person responsible for the subdivision of land or responsible for the development of land where no subdivision is required.
- (b) Drawings and specifications for public improvements shall be reviewed and approved by the City Engineer as part of the review of the improvement plans. See also Section <>.
- (c) The installation of all public improvements shall be subject to the City Engineer's continuous inspection.
- (d) The installation of all public improvements required by this code shall be completed in accordance with approved improvement plans.
- (e) At the completion of construction, and before acceptance of the public improvements, the developer shall furnish the City a set of record or "as-built" reproducible drawings as well as a digital copy that is compatible with the City Engineer's software showing the locations of all public improvements including the sizes and elevations of all underground utilities.
- (f) The City shall not accept any public improvement for public maintenance until completion and final inspection and approval by the City Engineer.

§ 25-41. Required Inspections and Fees. (Existing B-900)

- (a) All improvements proposed to be made under the provisions of this article, both public and private, shall be inspected during the course of construction by the City Engineer. The improvements shall also be inspected and must be approved, as installed, by all regulatory bodies, such as Metropolitan St. Louis Sewer District, St. Louis County Health Department, St. Louis County Department of Highways and Traffic, and Missouri State Highway Department holding jurisdiction by virtue of statute of the State of Missouri.
- (b) All fees and costs connected with such inspections and all costs accruing in the review of the plans and specifications for such improvements shall be paid by the applicant responsible for installing such improvements.

²⁵ This is language that will allow for the City Engineer to adopt technical specs outside of the code but still be applicable as if they were part of the code including any outside design manuals that may be adopted in the future.

- (c) Before the final plat of the subdivision is approved by the Planning and Zoning Commission, the subdivider shall pay to the City of Kirkwood, as a land subdivision permit fee, an amount as set by the Council by resolution from time to time in order to defray the cost to the City of Kirkwood for processing the subdivision application and making the inspections required during construction.
- (d) The applicant shall pay a filing fee for a subdivision sidewalk waiver (See Section <>.) in an amount set by the Council by resolution from time to time where the sidewalk waiver is approved.

§ 25-42. Performance Guarantees for Public Improvements. (New)²⁶

- (a) If a subdivider or developer that is required to construct public improvement does not intend to completely construct such improvements prior to the recording of a final plat or the approval of a site plan, as applicable, then the subdivider or developer shall execute performance guarantees with the City prior to approval of a site plan or recording of a final plat. Such performance guarantee shall take any form allowed in Section <>.
- (b) The performance guarantee shall be an obligation for the faithful performance of any and all work and the construction and installation of all public improvements required to be done by the subdivider or developer, together with all engineering and inspection costs and fees incurred by the City.
- (c) **Guaranteed Amount (Revised B-640)**
 - (1) The performance guarantee shall be in an amount equal to the subdivider or developer's estimated total costs of materials and labor required to install or construct the improvements, as well as any costs for maintenance during the construction period, as approved by the City Engineer.²⁷
 - (2) Where applicable, engineering, plan review, and construction review fees, etc., shall be required to be a part of the engineers cost estimate.
 - (3) The performance guarantee shall guarantee the total required improvements but may be reduced upon written authorization of the City Engineer upon completion of specific improvements provided the released amount does not exceed 75 percent of the estimated cost for the specific improvement or 75 percent of the total initial amount of the performance guarantee. The total amount remaining in the performance guarantee shall continue to guarantee completion of all improvements until completely released in accordance with Subsection (4) below.
 - (4) Upon completion of all improvements and final inspection, and approval and acceptance by the City of improvements which will be maintained by the City, the City Engineer may release the remaining 25 percent of the performance guarantee.

²⁶ Most of this language is new although the requirement of performance guarantees is not. Furthermore, this section can be used whenever a performance guarantee is required by the City, not just for subdivisions.

²⁷ QUESTION FOR CITY ENGINEER– Does the City want require any performance guarantee for a maintenance period after construction is complete?

- (5) The performance guarantee may be held by the City until the City is provided written certification that improvements that have been constructed meet the standards and have been accepted for maintenance by other agencies such as the Metropolitan Sewer District, Kirkwood Water, Kirkwood Electric, St. Louis County Department of Highways and Traffic, and Missouri State Highway Department.
- (d) Subdivision Agreements²⁸**
- (1) Where the developer or subdivider chooses to post a performance guarantee in lieu of completion of improvements shown on the approved improvement plans prior to the final plat recordation or site plan approval, the subdivider shall be required to enter into a subdivision agreement.
- (2) The subdivision agreement shall be required regardless if the improvements are part of a subdivision or a development approved through the site plan review process.
- (3) The subdivision agreement shall be approved as to content and form by the City Attorney, with confirmation by the City Engineer, prior to approval of the final plat or the final site plan. The City shall provide to the subdivider a sample subdivision agreement during review of the final plat or site plan, as applicable.
- (e)** The performance guarantee and subdivision agreement shall contain the further condition that should one of the following conditions exist, the City may, at its option, cause all required work to be done and improvements constructed by using the performance guarantee.
- (1) The installation of all required improvements, as called for in these regulations, has not taken place within two years or an alternative time period²⁹ agreed on in the subdivision agreement with the City, and the subdivider has failed to establish reasonable cause for such delay to the satisfaction of the City Council and thereby to receive a time extension; and/or
- (2) The subdivider has not constructed the required improvements in accordance with the minimum standards specified by these regulations, and the subdivider is unwilling to modify and upgrade said improvements within a six-month time period of notice so as to be in compliance with the provisions of these regulations.
- (f)** The parties executing the performance guarantee shall be firmly bound for the payment of all necessary costs therefor.
- (g)** Unit prices used in the engineers cost estimate shall be based upon unit costs associated with public contracting (i.e., prevailing wage rates).
- (h)** Performance guarantees shall be made payable to the City of Kirkwood and be acceptable to the City Engineer and the City Attorney.
- (i)** Incomplete improvements that the City Engineer determines will constitute a safety hazard or maintenance issue, or will prevent the effective functioning of the improvements, shall be required to be completed prior to the approval of a final plat.

²⁸ This is not language in the existing code but is a suggested best practice for consideration. The City currently has an informal version of this approach but this would provide for a more formal approach. This would allow the City Engineer to create an agreement about how the subdivision process will proceed after approval including inspections, performance guarantees, etc. This issue will be revisited with the new City Engineer.

²⁹ This two-year timeframe is included in the current regulations.

(j) Types of Performance Guarantees³⁰

The following are the types of performance guarantees allowed by the City. The standards for each type of guarantee shall apply to any situation where a performance guarantee is required, regardless if it is related to a subdivision application or not.

(1) Irrevocable Letter of Credit

The following standards shall apply if an irrevocable letter of credit is utilized as a performance guarantee:

- (i)** The subdivider shall provide an irrevocable letter of credit from a bank or other reputable institution or individual subject to the approval of the City Attorney and City Engineer.
- (ii)** The letter shall be deposited with the City, and shall certify the following:
 - a.** The creditor guarantees funds in an amount equal to the cost, as estimated in accordance with Section <> for completion all required improvements.
 - b.** In the case of failure on the part of the subdivider to complete the specified improvements within the required time period, the creditor shall pay to the City immediately and without further action such funds as are necessary to finance the completion of those improvements, up to the limit of credit stated in the letter.
 - c.** This irrevocable letter of credit may not be withdrawn or reduced in amount until released by the City Engineer in accordance with this article.

(2) Certified Check, Wire Transfer, or Cash Deposit

The following standards shall apply if cash is utilized as a performance guarantee:

- (i)** The subdivider shall provide a certified check, wire transfer, escrow to a third-party escrow account, or cash deposit for the amount of the guarantee, payable to the City of Kirkwood.
- (ii)** When the improvements are complete, the City shall issue a check for the released amount based on this subsection.
- (iii)** The City shall not be responsible for paying interest for the period of time the City retains the guarantee.

³⁰ This is based on some common practices from other communities has been refined to address the types of guarantees the City accepts.

(k) Protection of Streets, Utilities, and Other Installations (New)

- (i) The developer or subdivider shall provide the City Engineer with a plan for the routing of construction equipment and traffic with the objective of alleviating any need to traverse adjacent off-site residential streets. In exceptional cases, where no reasonable alternative exists or can be provided, construction equipment may be permitted the use of collector streets for a predetermined time period. The contractor shall be permitted to operate only pneumatic-tired equipment over any paved street surfaces and shall be responsible for correction of any damage to street surfaces or public improvements in any manner resulting from the contractor's operation. During the period of use, such streets shall be kept reasonably free of debris, based on periodic inspections by the City and in accordance with approved sedimentation and erosion control measures.
- (ii) The developer or subdivider and their contractors shall protect the pavement against all damage prior to final acceptance of the work including damage created by the contractor's construction equipment and vehicles, as well as general traffic. As soon as curing and sealing are completed, the contractor shall clean the pavement free of all debris and construction equipment.
- (iii) The developer or subdivider and their contractors shall at all times take proper precautions for the protection of utility lines. The developer or subdivider shall be financially responsible for the repair of any damage to such utility lines.

§ 25-43. General Subdivision Design Standards.

(a) General (Existing B-700)

In the design of each subdivision, or portion thereof, the subdivider shall conform to the principles and standards of land subdivision that will encourage good development patterns as set out in this article. Subdivisions shall provide for the coordinated development of adjacent parcels of property.

(b) Traffic Control Devices (New)

The subdivider shall provide all traffic control devices for the proposed development, including, but not limited to, traffic signals, signs, pavement markings and the like. Refer to the Manual of Uniform Traffic Control Devices (MUTCD) for details of the devices to be used, and, in some cases, warrants for their use.

(c) Debris and Waste (New)

No cut trees, diseased trees, timber, debris, earth, rocks, stones, soil, junk, rubbish or other waste materials of any kind shall be buried in any land, or left or deposited on any lot or street at the time of the final inspection. No items and materials as described in the preceding sentence shall be left or deposited in any area of the subdivision at the time of dedication of public improvements.

(d) Environmental Protection and Common Ground (Revised B-750)

- (1) In the subdividing of any land within the City of Kirkwood, due regard shall be shown for all-natural features, such as tree growth, watercourses, or other similar elements which, if preserved, would add attractiveness to the proposed development.

- (2) The subdivision shall be designed to minimize development in any floodplain or floodway as defined by FEMA. The platting of lots for residential occupancy in a 100-year floodplain shall be discouraged unless the subdivider can document that any habitable structure shall be located outside the 100-year floodplain.
 - (3) The natural topography shall be retained wherever possible in order to reduce excessive stormwater runoff onto adjoining property and to avoid extensive regrading of the site.
 - (4) The location and floor elevations of all proposed buildings shall be carefully studied in relation to proposed street grades, existing topography, trees, and pertinent site features in order to preserve all such features insofar as possible and desirable.
 - (5) Consideration shall be given to increasing the setback or front building line from that required in the zoning district in which the subdivision is located in order to retain, whenever possible, existing topography, rock formations, large trees natural features, natural watercourses, historical sites, or other similar assets.
 - (6) The building area of a lot shall not be within 50 feet of the center line of an existing watercourse.
 - (7) To protect adjacent and downstream property from the effects of erosion and siltation, the Planning and Zoning Commission or City Council may require common ground be preserved in a natural state for areas within 35 feet of the center line of an existing watercourse or on slopes of 25 percent or greater grade.
 - (8) The minimum area of any parcel of land designed as common ground shall be 5,000 square feet and have a minimum 20-foot wide access to public right-of-way. There may be more than one parcel of common ground in a subdivision; however, each parcel shall have no less than the foregoing minimum area. Common ground located within cul-de-sacs shall be exempt from this requirement.
 - (9) If construction activities disturb land or entail the grading or excavation of a surface area of five acres or greater, a land disturbance permit shall be obtained from the Department of Natural Resources.
- (e) **Subdivision Names (New)**
The proposed name of the subdivision shall not duplicate or too closely approximate phonetically, the name of any other subdivision in the City of Kirkwood or St. Louis County. The City shall have final authority to designate the name of the subdivision.
- (f) **Street Lights (Existing B-850)**
- (1) Provision shall be made by the subdivider for the installation of streetlights along all public streets within the subdivision. A streetlight shall be provided at each intersection of streets, at each intersection of a street with a pedestrian walkway, at each circular turnaround, and at intervals of not greater than 300 feet between such locations.
 - (2) Streetlights shall be mounted on ornamental concrete or steel poles serviced by underground wiring and shall conform to the recommendations of the City Engineer, as approved by the Planning and Zoning Commission, for each installation.
 - (3) When located in the service area of Kirkwood Electric, electric current for streetlighting will be provided by the City of Kirkwood, without cost to the property owners in the subdivision and does not in any way pertain to or effect the costs associated with the installation of streetlighting, fixtures, etc.

(g) Monuments, Marks, and Benchmarks (Existing B-865)

- (1)** A complete survey shall be made by a registered surveyor.
- (2)** Permanent survey monuments shall be set as follows:
 - (i)** At the intersection of all lines forming angles in the boundary of the subdivision; and
 - (ii)** At the intersection of street property lines and at the beginning and end of all curves along street property lines.
- (3)** Unless the point is located by monument, markers shall be set as follows:
 - (i)** At all points where lot lines intersect street right-of-way lines;
 - (ii)** At all angles in the lot property lines; and
 - (iii)** At all other lot corners.
- (4)** Monuments shall be approved by the Director of Public Services or shall be constructed of concrete with minimum dimensions of four inches by four inches at the top and six inches by six inches at the bottom with a length of three feet. They shall be marked with either a copper or steel dowel embedded so that the top of the dowel shall be flush with the top surface at the center of the monument. Monuments shall be set so that the bottom extends at least four inches below frost line.
- (5)** Markers shall consist of galvanized steel or wrought iron pipe, or steel bars at least 18 inches in length and 3/4 of an inch in outside diameter.
- (6)** Monuments and markers shall be so placed that the center point shall coincide with the point to be marked and the top is level with the surface of the surrounding ground after final grading.
- (7)** Monuments and markers shall be set after the completion of all grading operations and in such manner as to preclude their destruction during subdivision construction activities.
- (8)** Where a permanent benchmark is not located within 1,000 feet of the center of the subdivision and so noted on the final plat, a permanent bench mark, elevation of which is referred to mean sea level, shall be set and accurately noted on the subdivision plat.

§ 25-44. Privately Developed Facilities. (Existing B-870)

Where a subdivision or development is to contain pavements, walks, sewers, sewage treatment facilities, water supply systems, park areas, or other physical facilities which will not be owned, operated or maintained by existing public agencies, provision shall be made by trust agreement, which is part of the deed restrictions and which is acceptable to the proper public agencies having jurisdiction, for the continuing maintenance, supervision, operation, reconstruction of such facilities by the property owner or the lot owners of a subdivision, as applicable.

§ 25-45. Lots. (Revised B-730)³¹

The following regulations shall govern the design and layout of lots.

- (a) The size, shape, and orientation of lots and the orientation of structures shall be designed to provide desirable building sites logically related to topography, natural features, streets, parking areas, common land (if any), other structures, and adjacent land uses. Due regard shall be given to preserving natural features which would add attractiveness and value to the neighborhood such as large trees, unusual rock formations, watercourses, and sites which have historical significance, scenic views, and similar assets.
- (b) Lots shall be more or less rectangular in form; triangular, elongated, or other shapes that restrict its use as a building site shall be avoided to the maximum extent feasible.
- (c) All lots shall conform to, or exceed, the requirements of the site development standards for the applicable zoning district (See Section.) or the community unit plan regulations (See Section <>.).
- (d) All lots shall abut and have access to a public street on a public right-of-way dedicated to the City of Kirkwood, St. Louis County, or the State of Missouri.
- (e) Double frontage lots should not be platted except that, where desired along major streets, lots may face on an interior street and back onto such thoroughfare. In the event double frontage lots are created on adjacent property, appropriate screening shall be approved by the Planning and Zoning Commission.
- (f) Side lines of lots shall be at approximately right angles to straight streets and on radial lines on curved streets.
- (g) Lot lines at street intersections shall be rounded with a minimum radius of 25 feet.

§ 25-46. Blocks. (Revised B-720)

The following regulations shall govern the design and layout of blocks.

- (a) The arrangement of blocks shall be such as to conform to the street planning criteria set forth in Section <> and shall be arranged to accommodate lots and building sites of the size and character required for the applicable zoning district as set forth in this code.
- (b) Subdivisions designed for residential uses shall be designed with blocks of sufficient width to permit two tiers of lots of appropriate depth, except where an interior street parallels a limited access highway or railroad right-of-way.
- (c) Blocks that will contain multi-family dwellings or nonresidential uses shall be adequate to accommodate the building sites and provide the yards, setbacks, service drives, off-street parking and other required facilities, and shall be designed for unit development and not necessarily according to the typical lot and street pattern.
- (d) Blocks shall have a maximum length of 1,250 feet.
- (e) In reviewing the subdivision plat, the Planning and Zoning Commission and City Council can modify these requirements for blocks that will be located adjacent to nonresidential uses or where there are unusual topographic or natural features.

³¹ The current provisions related to specific lot types and lot standards shall be consolidated and updated as part of the site development standards (e.g., lot area, width, setback, etc.) as part of a separate section so they have been removed from this article.

- (f) Within blocks proposed at more than 700 feet in length the Planning and Zoning Commission may require, at or near the middle of the block, a public walkway connecting adjacent streets or public areas, shopping centers, etc. Such walkway shall be at least 10 feet in width of right-of-way and shall be dedicated to public use for pedestrian purposes only.
- (g) Irregularly shaped blocks, those intended for cul-de-sac or loop streets, and those containing interior parks or playgrounds, may be approved if properly designed and located and if the maintenance of interior public spaces is covered by agreements.

§ 25-47. Nonresidential Subdivisions. (Revised B-760)

In addition to the principles and standards of this article that are appropriate to the planning of all subdivisions, the subdivider of a subdivision intended for nonresidential use shall demonstrate to the satisfaction of the Planning and Zoning Commission and City Council that the street, parcel, and block pattern proposed is specifically adapted to the uses anticipated, and is compatible with other uses in the vicinity. For such proposals, the following principles and standards shall be observed:

- (a) Street right-of-way and pavement shall be adequate to accommodate the type and volume of traffic anticipated.
- (b) The Planning and Zoning Commission or City Council may impose special requirements with respect to street, curb, gutter, streetlight, planting, sidewalk, utility, and other improvements to meet special needs.
- (c) Lots that are platted adjacent to residential uses or residential zoning districts shall have increased width, depth, and/or area to provide adequate space for screening and/or buffering as required by the code. See also Article <>.
- (d) No public or private street shall be platted which connects to a minor existing street which has residential zoning districts on both sides.

§ 25-48. Streets and Thoroughfares. (Revised B-810)

(a) General Design Requirements

- (1) The street design elements of a subdivision shall be considered in their relation to existing and planned streets, topographical conditions and public convenience and safety and in their appropriate relation to the proposed uses of the land to be served by such streets.
- (2) The street layout shall provide access to all lots and parcels of land within the subdivision unless access is provided through easements as part of an approved planned commercial development.
- (3) Access control at major arterials and highways shall be taken into consideration in the design of the subdivision plat. The City, County or State has the right to define and limit access along major arterials or highways according to jurisdiction.
- (4) The subdivider shall provide within the boundaries of the subdivision plat the necessary right-of-way for the widening, continuance or alignment of such streets in conformity with the comprehensive plan or other applicable street plans.
- (5) Where practical, the arrangement of streets in new subdivisions shall make provision for the continuation of existing streets in adjoining areas.

- (6) Where adjoining areas are not subdivided or developed, the arrangement of streets in new subdivisions shall make provision for the proper projection of streets (i.e., provide for temporary dead-end streets where street connections can be made to the adjacent land) as required by the City Engineer.
 - (7) New subdivisions shall be based on a grid or modified grid system to the maximum extent feasible.³²
 - (8) Minor, or neighborhood streets, shall be designed so as to discourage through traffic. Subdivision streets shall be platted to allow the distribution of traffic throughout the City.
 - (9) Alleys shall be prohibited in residential areas but may be included in commercial and industrial areas, when approved by the Planning and Zoning Commission where needed for loading, unloading, or access purposes for the public benefit.
 - (10) Reserved strips controlling access to streets shall be prohibited.
 - (11) Gated communities and other residential developments where a gate or other barrier are placed across a road that is designed to appear or that function as walled-off area are discouraged but may be approved as part of a subdivision modification approval (See Section <>.) if in compliance with the following:
 - (i) Gates or barriers may only be considered for subdivisions with private streets.
 - (ii) Gates and barriers may not extend across public sidewalks, where required, and the public shall have access to the public sidewalks.
 - (iii) The subdivision modification approval must include provisions for 24-hour access by emergency services (e.g., fire, police, emergency medical services, etc.).
 - (12) A street that is not constructed to City standards will not be accepted by the City for dedication as a public street.
 - (13) Approval shall not be given for streets within a subdivision which would be subject to flooding. All public streets must be located at elevations which will make them flood-free, in order that no portion of the subdivision would become isolated by floods.
 - (14) In the interest of public safety, and as a matter of policy, all points of ingress and egress shall be located as far as possible from the intersection of two or more major streets or highways.
- (b) Street Names, Signs, and Numbering (Revised B-855)**
- (1) Street names shall be selected that will not duplicate or be confused with the names of existing streets in the City of Kirkwood and in St. Louis County irrespective of modifying terms such as street, avenue, boulevard, etc.
 - (2) Streets that are or will eventually be continuations of existing or platted streets shall be named the same.
 - (3) Street names shall be included on the preliminary plat and final plat.

³² Given the City's desire to be more walkable, we have included these two provisions on grid design and prohibition of gated communities for consideration.

- (4) Street name signs shall be erected at all street intersections on diagonally opposite corners so that they normally will be on the right-hand side of the intersection for traffic on the more heavily traveled street. Signs indicating both streets should be erected at each location mounted as close to the corner as practical, facing traffic on the cross street, with the nearest portion of each sign not less than one foot nor more than five feet back of the curb line.
- (5) The design, materials of construction and method of installation of street name signs shall conform to the current standard employed by the City of Kirkwood Public Services Department for such work at the time of installation.
- (6) Address numbers shall be assigned by the City in accordance with the current numbering system.

(c) General Street and Right-of-Way Design Standards

(1) Minimum Street Right-Of-Way, Pavement Widths, and Curb/Gutters

- (i) Street improvements, including paving, curbs, sidewalks, preparation of subgrade, bridges, culverts, etc., shall be constructed in accordance with plans and specifications, prepared for the subdivider by a professional engineer registered to practice in the State of Missouri.
- (ii) All construction shall be completed in accordance with the approved plans and specifications and in a manner acceptable to the authorities having jurisdiction. When changes from approved plans and specifications become necessary during construction, written approval from the City Engineer shall be secured before the execution of such changes.
- (iii) The City shall not accept any street for maintenance until completion and final inspection and approval by the City Engineer.
- (iv) Prior to the construction of street or alley pavements, all subsurface utility pipes and sewers shall be installed as required, and trenches backfilled with backfill material thoroughly compacted in place in accordance with the requirements of Section <> Backfill Requirements) of this article.
- (v) The minimum right-of-way and pavement width of public streets shall conform to the width designated in Table <>. The Planning and Zoning Commission and City Council, in their review of the proposed subdivision or development, may vary this width when an increased width is recommended in an adopted plan or is necessary to accommodate a boulevard.
- (vi) Whenever there exists a dedicated or platted portion of a street adjacent to the tract to be subdivided or to the proposed site for development, the applicant shall dedicate by subdivision plat additional right-of-way so that such streets will have a minimum right-of-way or pavement width shown in Table <> or that shown in an adopted plan.
- (vii) When a proposed subdivision adjoins an existing street that does not conform to the required width established in Table <>, a minimum of 1/2 of the required width shall be constructed as measured from the center line of the existing pavement.

- (viii) If the existing rights-of-way within a subdivision are not as specified in Table <> below, the subdivider shall dedicate additional right-of-way by subdivision plat so that such streets will meet the standards of this article.
- (ix) The subdivider shall be responsible for establishing the minimum right-of-way width and installing the pavement width (measured from back of curb to back of curb) required in Table <> below.

TABLE <>: MINIMUM PAVEMENT AND RIGHT-OF-WAY WIDTHS FOR PUBLIC STREETS³³		
Street Type	Right-of-Way Width	Minimum Pavement Width [1]
Major Street	80 feet	50 feet
Collector – Residential ³⁴	60 feet	36 feet
Collector – Nonresidential	80 feet	50 feet
Minor/Local – Residential	50 feet [2]	26 feet
Minor/Local – Nonresidential ³⁵	60 feet	38 feet
NOTES: [1] As measured from the back of the curbs. See also Subsection <> below for additional width requirements for on-street parking. [2] For cul-de-sac streets serving less than nine single-family dwellings, including corner lots, the right-of-way width may be reduced to 40 feet for the purpose of reducing site grading.		

- (x) Where parkways or special types of streets are proposed, the Planning and Zoning Commission and City Council may modify the standards in the design of such parkways and streets to be followed in the design of such parkways or streets.
- (xi) A parking lane at least eight feet wide on one or both sides of the street and paved in accordance with the current specifications may be required by the City Engineer, and such requirement may be in addition to the necessary number of lanes for moving traffic.
- (xii) Table <> establishes the minimum standards for the horizontal visibility on curved streets, vertical visibility on all streets, and horizontal curvature on all streets as maintained and measured along the center line.

TABLE <>: VISIBILITY AND CURVATURE STANDARDS	
Major Street	500 Feet
Collector – Residential	300 Feet
Collector – Nonresidential	300 Feet
Minor/Local – Residential	150 Feet
Minor/Local – Nonresidential	150 Feet

³³ All of these requirements need to be reviewed by the City Engineer but are intended to provide for more walkable streets.

³⁴ This table breaks out the different street types by primary use because there is a big distinction between a collector street that serves residential uses over those that serve nonresidential uses. The same applies to minor streets.

³⁵ QUESTION – The City identifies alleys in the subdivision standards but really treats them as minor streets, only allowed in nonresidential areas. Is there any desire to address alleys in these standards?

- (xiii) The pavement shall be constructed of portland cement concrete or asphaltic concrete in accordance with the standard specifications of the Department of Highways and Traffic of St. Louis County, Missouri, except as amended herein. Design characteristics shall be at least equal to that established in Table <>.

TABLE <>: MINIMUM CONSTRUCTION REQUIREMENTS ³⁶			
	Major Street	Collector Street	Minor/Local Street
Concrete Pavement [1]			
Concrete Thickness	8 inches	8 inches	7 inches
Rolled Stone Base [2]	4 inches	4 inches	6 inches
NOTES: [1] Concrete pavement shall consist of portland cement concrete consisting of 6 1/4 sacks of cement per cubic yard with a maximum slump of four inches. All concrete shall be air-entrained with an air content of 4% to 6%. No calcium shall be added to the mix. [2] The rolled stone base shall be constructed of two-inch clean crushed stone.			
Asphaltic Concrete			
Surface Course	2 inches	2 inches	2 inches
Asphaltic Concrete Base	10 inches	10 inches	8 inches
Rolled Stone Base	0 inches	0 inches	0 inches

- (xiv) Transverse under drains shall be required under street pavement at all sags, low points, or other locations which contain a stormwater inlet adjacent to the street pavement.

(2) Street Grades

- (i) All changes in grade shall be connected by vertical curves to provide a smooth transition and the required sight distance.
- (ii) Between reversed curves on major streets, there shall be a tangent of not less than 100 feet, and on collector and minor streets, such tangent shall be not less than 40 feet.
- (iii) Maximum grades for streets shall be as follows:
 - a. Major streets shall not have a grade greater than percent.
 - b. Collector streets shall not have a grade greater than 10 percent.
 - c. Minor or local streets shall not have a grade greater than 10percent; however, grades up to 12 percent may be approved by the Planning and Zoning Commission and City Council for the purpose of reducing site grading.
- (iv) At street intersections:

³⁶ These standards are the same as the current requirements and will not change unless recommended by the City Engineer due to the technicality of the standards.

- a. The grade of collector and minor streets shall not be greater than four percent for a distance of 50 feet from the center of the intersection.
 - b. The grade of major streets shall not be greater than three percent for a distance of 50 feet from the center of the intersection.
 - (v) The maximum grade of a cul-de-sac shall not be greater than five percent.
 - (vi) Street grades may exceed these limitations when recommended by the Planning and Zoning Commission and approved by the City Council for the purpose of conforming the street grade to the contour of the existing land to reduce overall site grading and preservation of site vegetation.
 - (vii) The minimum grade of any street gutter shall not be less than two percent.
- (3) Curbs and Gutters (Exiting B-815)**
- (i) Curbs or curbs and gutters shall be constructed in conjunction with all street pavements.
 - (ii) Combination curb and gutter shall be of portland cement concrete at least 18 inches wide and not less than seven inches thick where the gutter abuts the street pavement.
 - (iii) Curb construction for concrete pavements may be integral with the pavement, and roll-type curbs may be permitted on residential streets where no hazard to pedestrians is involved.
- (4) Street Intersections**
- (i) The angle of intersection between local streets and arterial streets should not vary by more than ten degrees from a right angle. All other streets should intersect each other as near to a right angle as possible.
 - (ii) Intersection of more than two streets at one point shall be prohibited.
 - (iii) A minimum radius of 32 feet at the back of curb shall be required at all street intersections.
 - (iv) Not more than two streets shall intersect at any one point, unless the City Engineer advises the Planning and Zoning Commission and City Council that such an intersection can be constructed with no extraordinary danger to public safety.
 - (v) Whenever possible, proposed intersections along one side of a street shall coincide with existing or proposed intersections on the opposite side of such street. In any event, where a centerline offset (jog) occurs at an intersection, the distance between centerlines of the intersecting streets shall be not less than 125 feet on minor/local streets and 400 feet on collector and major streets.
 - (vi) If the angle of intersection of two streets is less than 60°, the radius of the arc at the intersection of the property lines shall be approved by the City Engineer. At the intersections of other streets, the property line corners shall be rounded by arcs with radii of not less than 20 feet, or chords of such arcs.
 - (vii) The property line corners shall be rounded with radii of not less than 15 feet or chords of such arcs at the intersections of streets and alleys.
 - (viii) Intersections of two minor/local residential streets should be designed to maintain suitable traffic volumes and speeds.

(5) Special Street Types and Street Requirements

The following requirements shall apply to special street types or under the specified circumstances:

(i) Private Streets

- a.** All platted streets shall be public rights-of-way dedicated to the City of Kirkwood.
- b.** If a subdivision modification is granted for private streets, the private streets shall be constructed to the same standards as public streets. Maintenance of private streets shall be the sole responsibility of the property owners or trustees of the subdivision. When streets are proposed as private, the developer shall provide a trust indenture establishing the method for providing continuous maintenance of the streets, streetlights, stormwater, and other facilities which normally occur within the right-of-way or street easement. The front yard area (building line) on a private street shall be measured from the street right-of-way line.

(ii) Dead-End Streets (New)

- a.** Permanent dead-end streets shall not be permitted.
- b.** Where a subdivision adjoins un-subdivided land, a temporary turn-around shall be provided for each street more than 200 feet in length if lots front thereon, and provisions shall be made for future extension of the street and utilities and reversion of the excess right-of-way to the abutting properties and the same shall be so noted on the final plat.

(iii) Cul-De-Sacs

- a.** A cul-de-sac street shall have a maximum length of 1,000 feet measured from the centerline of the nearest street intersection to the center of the cul-de-sac turnaround.
- b.** The center line of a newly platted street shall not be located closer than 250 feet from the center diameter of a cul-de-sac except when no other public street access is available to serve the parcel being developed.
- c.** For residential, minor/local streets, each cul-de-sac shall be provided with a turnaround having a minimum pavement radius of 55 feet measured from face of curb and a minimum right of way radius of 60 feet.
- d.** The center cul-de-sac planting island shall be a maximum radius of 16 feet. An area three feet behind the curbing of the island of a cul-de-sac shall be free of obstructions.
- e.** The standards for cul-de-sac streets in commercial and industrial developments shall be determined, by consulting with the City Engineer and the Planning and Zoning Commission, at the time of preliminary plat review or during development plan review.
- f.** A cul-de-sac street shall not exceed 1,000 feet in length as measured from the nearest intersecting street or turnaround.

(iv) Half-Streets

The dedication of new half-streets shall not be permitted. Where a dedicated or platted half-street exists adjacent to the tract being subdivided, the other half shall be platted if deemed necessary by the City Engineer.

§ 25-49. Sidewalks, Walkways, Trails, and Bikeways.³⁸

All subdivisions shall comply with the applicable requirements of Section <>.

§ 25-50. Easements. (Revised B-740)

- (a)** All underground public utility lines, wires, cables, conduits, vaults, laterals, pipes, mains, valves and other similar distributing equipment shall be placed within easements or dedicated public ways in such a manner so as not to conflict with any other underground service previously installed.
- (b)** Easements for utilities shall be provided. Such easements shall have a minimum width of 10 feet, and, where located along interior lot lines shall normally be taken from one lot. Before determining the location of easements on the plat, the developer shall discuss the plan with the local utilities companies in order to assure proper placement for the installation of services. Adequate sewer and drainage easements, as required by Metropolitan St. Louis Sewer District, shall be provided.
- (c)** The City Engineer may require a wider easement where necessary to provide adequate separation between water, sewer, and/or stormwater management facilities.³⁹
- (d)** Easements may also be required across lots where engineering design or special conditions may necessitate the installation of water and sewer lines outside of public rights-of-way.
- (e)** Wherever a subdivision is traversed by a watercourse, drainage channel, or stream, there shall be provided a drainage right-of-way which shall be for the purpose of widening, straightening, improving or protecting the stream at the subdivision's expense as a part of the subdivision improvements. The width of the drainage right-of-way shall be adequate for any necessary channel relocations and straightening, and the plan shall be reviewed with and approved by Metropolitan St. Louis Sewer District prior to final approval by the City.
- (f)** Common ground easements, such as cul-de-sac islands, shall be dedicated to the trustees of the aforementioned subdivision for landscape maintenance. No aboveground structure, other than required streetlights or other public utilities in accordance with the approved improvement plans, may be constructed or installed within a cul-de-sac island without authorization by the City.

³⁸ There will be an entire section on mobility for pedestrians, whether as part of a subdivision or not, in the new parking and mobility article. Ultimately, we may move them back to this article depending on how it will work best for the City.

³⁹ This provision along with Paragraphs (a) and (d) are new to the City.

§ 25-51. Site Grading/Environmental Protection. (Revised B-805)

- (a) Grading of the subdivision site shall be done in accordance with the final improvement plans approved by the City Council unless the City Council, in its sole discretion, authorizes grading following the review of the grading plan and as part of the City Council approval of the preliminary plat. No clearing of trees eight inches or larger in caliper shall be permitted until grading is authorized by the City Council as set forth above.
- (b) A grading plan shall be included in the preliminary plat showing existing and proposed contours at intervals sufficient to clearly show the slope of the existing ground surfaces and the extent of the proposed grading. It shall be prepared on a plat showing the subdivision layout as proposed on the final plat, the location and first floor elevation of each building proposed to be built in the subdivision, and all existing trees eight-inch caliper and larger and other pertinent site features which could be affected by site grading.
- (c) The slope of the finished ground surface between lots, between adjacent properties and between lots and streets shall not be steeper than two horizontal to one vertical when in cut, nor steeper than three horizontal to one vertical in fill.
- (d) The grading plan will be examined and approved or rejected by the Planning and Zoning Commission and the City Council on the basis of factors such as preservation of the natural features of the site, providing adequate drainage of the area, protection of adjacent and downstream property from the effects of erosion and siltation, the location and gradient of streets, access to lots from streets, and similar criteria.
- (e) Interim stormwater drainage control in the form of siltation control measures shall be required to protect adjacent property and public right-of-way.
- (f) Erosion and sediment control devices shall be approved by the Department of Natural Resources if construction activity disturbs a land surface area of five acres or greater.

§ 25-52. Utilities and Other Infrastructure.

(a) General Requirements for Utilities and Underground Facilities

- (i) All public and common electric, cable, and telephone lines and other utilities shall be located underground and shall be placed in their own easement, shown on the final plat. These underground utility requirements shall also apply to any lines required to serve the new development that extend outside the boundary of the development. The conduits or cables shall be located within easements or public rights-of-way in separate trenches, in a manner which will not conflict with other underground services.
- (ii) Installation of utility lines and appurtenances, whether above- or below ground, shall be located so as to reduce unsightliness and hazard to the public to a minimum.
- (iii) Where cable, fiber optic, television, or similar services or conduit is or will be in operation, the applicant shall install cable or conduit for such service simultaneously with and in the same manner as electric and telephone cables are installed, both within the right-of-way and to individual building connections.
- (iv) Whenever public improvements are installed, the open cutting of roads shall be avoided to the greatest extent practicable.
- (v) All sewer, water, and other utility pipelines shall preferably be placed outside the limits of the pavement.

- (vi) Backfill for utility installation trenches shall conform to the requirements of Section <> (Backfill Requirements) of this article.

(b) Sanitary Sewers and Sewage Disposal (Existing B-830)

- (1) A system of sanitary sewers and appurtenance, providing a connection to each lot in the subdivision, designed in accordance with the standard specifications and requirements of the Metropolitan St. Louis Sewer District and installed under permit from and inspection of said sewer district, shall be installed in the subdivision, original construction shall include installation of house laterals to the property line for all lots in the subdivision.
- (2) Plans for the sanitary sewer system shall be prepared by a professional engineer, registered to practice in the State of Missouri, and shall carry the stamp of approval of the Metropolitan St. Louis Sewer District when submitted to the Planning and Zoning Commission for approval.
- (3) Construction of the sanitary sewer system and inspection of Metropolitan St. Louis Sewer District and, upon completion of construction, acceptance for maintenance by Metropolitan St. Louis District shall be obtained by the subdivider from the district, in accordance with the regulations and requirements of said district.
- (4) The sanitary sewer system, of the subdivision, when completed, shall connect to the sanitary sewer lines of the Metropolitan St. Louis Sewer District; or, except as provided in Subsection (7) below, if such connection is impracticable, the subdivider shall provide a local sewage disposal facility for the subdivision.
- (5) Plans and specifications for such local sewage disposal facility shall be prepared for the subdivider by a professional engineer registered to practice in the State of Missouri, and the facility shall be designed and installed in accordance with the regulations of the state Board of Health and under the inspection of the St. Louis County Health Department and Metropolitan St. Louis Sewer District.
- (6) Acceptance of a local sewage disposal plant for operation and maintenance shall be by Metropolitan St. Louis Sewer District and shall be obtained by the subdivider in accordance with the requirements of said sewer district.
- (7) In cases where no outlet to the sanitary sewer system of the Metropolitan St. Louis Sewer District is reasonably available for a two-lot subdivision development and where each lot contains a minimum of one acre, the subdivider may be permitted to install a disposal system for each lot (septic tank with disposal field). Such individual sewage disposal systems shall be erected in accordance with the regulations and requirements of the state Board of Health and under the supervision and inspection of the St. Louis County Health Department.
- (8) Backfill of trenches for sanitary sewer installations shall conform to the requirements of Section <> (Backfill Requirements) of this article.

(c) Water Supply (Existing B-825)

- (1) A system of water mains, valves, and fire hydrants connected to the water supply system of the City of Kirkwood shall be installed by the subdivider. The system shall be designed to supply water service and fire protection to all lots in the subdivision and to ensure proper circulation to and within the system. Materials and construction methods shall conform to those currently employed and specified by the City of Kirkwood Water Department. Water mains shall be sized and fire hydrants shall be located as required by the Insurance Services Offices of Missouri and the City of Kirkwood Fire Marshal and Director of Public Services. Fire hydrants shall be spaced no more than 600 feet apart and water mains shall be a minimum of six inches in size. Plans shall be prepared by a professional engineer, registered to practice in the State of Missouri, and shall be approved by the Insurance Services Office of Missouri and the Director of the City of Kirkwood Water Department before approval by the Planning and Zoning Commission.
- (2) The water system installed by the subdivider as proposed in this section shall, upon approval and acceptance, become at once the property of the City of Kirkwood; and the City shall have exclusive control and use thereof, subject to the right of the owners and residents of property in the area subdivided to be served thereby, under the rules and regulations of the Water Department of the City of Kirkwood.
- (3) In areas where connection to the City of Kirkwood water supply system is impractical, a separate source of water supply, approved by the state Department of Health and Department of Natural Resources shall be provided by the subdivider. Assurance of the continued availability of such approved source of water supply, acceptable to the City Council and prepared on forms approved by the City Attorney, shall be provided.
- (4) Backfill of water line trenches shall conform to the requirements of Section <> (Backfill Requirements) of this article.

(d) Storm Sewers and Stormwater Management (Existing B-835)

- (1) Adequate provision shall be made for the disposal of stormwater, subject to the approval of the Planning and Zoning Commission and the Metropolitan Sewer District. The detailed plans for the proper disposal of stormwater affecting the proposed subdivision, including the runoff from the area tributary as well as the area being developed, shall include such improvement as may be necessary to all open drainage channels, such as widening, straightening and paving, and a system of underground pipe sewers and appurtenances, which shall be separate and independent of the sanitary sewer system. The plans shall be prepared by a professional engineer, registered to practice in the State of Missouri, in accordance with the standard specifications and requirements of the Metropolitan St. Louis Sewer District.
- (2) Plans for stormwater facilities, when submitted to the Planning and Zoning Commission for approval, shall bear the stamp of the approval of the Metropolitan St. Louis Sewer District.
- (3) The construction of stormwater facilities shall be under permit from the inspection of said Metropolitan St. Louis Sewer District, and upon completion of construction, acceptance for maintenance by said Metropolitan St. Louis Sewer District shall be obtained by the subdivider from the district, in accordance with the regulations and requirements of said district.

- (4) If stormwater detention is required by the Metropolitan Sewer District or the City of Kirkwood for single-family residential subdivisions, it shall be provided underground in pipes or chambers designed for such detention. The pipes or chambers shall be constructed of reinforced concrete and shall be covered with earth and shall not be located in the principal building area of any lot. Dry or wet aboveground detention shall not be permitted in single-family subdivisions.
 - (5) Backfill of trenches for storm sewer installations shall conform to the requirements of Section <> (Backfill Requirements) of this article.
 - (6) New subdivisions shall comply with Chapter 5, Article VI (Infill Development Storm Water Management), as applicable.
- (e) Green Infrastructure (New)⁴⁰**
- (1) Green Infrastructure Techniques**
 - (i) The City encourages the use of green infrastructure techniques because of their connection to sustainable development practices and environmental quality. The proper use of green infrastructure can dramatically improve storm water runoff quality, decrease runoff volume, protect downstream streams and rivers, and create more interesting places to live.
 - (ii) The following green infrastructure techniques may be incorporated into new subdivisions with approval from the City Engineer, provided that the applicant submits documentation that the proposed green infrastructure technique is effective and will equal or exceed the function of traditional infrastructure techniques and meet the requirements of this code:
 - a. Narrower pavement widths;
 - b. Narrower right-of-way widths;
 - c. Grassy swales and shoulders without curb and gutter;
 - d. Pedestrian walkways that do not constitute the sidewalks required by Section <>;
 - e. Permeable pavements (e.g., pavers, permeable concrete, permeable asphalt pavement);
 - f. Bioretention swales;
 - g. Planter boxes;
 - h. Curb extensions; or
 - i. Other techniques.
 - (2) Criteria for Green Infrastructure Waivers**

The City Engineer may grant a green infrastructure waiver for use of the green infrastructure techniques provided:

⁴⁰ This is some model language that would give the City Engineer the ability to approve green infrastructure techniques. Eventually, the City can incorporate specific techniques that are acceptable without a waiver as part of a future design manual.

- (i) The techniques will utilize the landscape or nature's ability to reduce, slow, filter, and/or absorb storm water runoff from streets, parking lots, and buildings in a method that equals or exceeds the existing infrastructure requirements of the City;
- (ii) The techniques are consistent with best management practices; and
- (iii) The technique has been designed by a professional engineer and is accompanied by documentation stating that the proposed technique does not pose a threat to the public safety.

§ 25-53. Backfill Under Pavements. (Existing B-845)

All open excavations for sewers and for public utilities (except the gas utility) made under existing pavements or areas proposed to be paved shall be carefully backfilled with granular backfill material, approved by the City Engineer, thoroughly compacted in place in such a manner as to inhibit any settlement of the finished pavement. Such excavations made in existing paved areas shall be made in accordance with the requirements and regulations of Chapter 20, Article IV, Excavations, of the Code of Ordinances, City of Kirkwood, Missouri. The exception of the gas utility from the granular backfill provisions of this section does not exempt that utility from thorough compaction of its backfill so as to avoid pavement settlements.