

## CHAPTER 43 -- Subdivision Regulations

### Subchapter A - Definitions

43.020. Definitions. As used herein, the following words, terms, and phrases shall have the following meanings:

1. Alleys. Minor ways which are used primarily for vehicular service access to the back or side of properties abutting on a street.
2. Building line. A line or lines on a plat designating the area adjacent to the street right-of-way inside of which no building or structure may be erected.
3. City. The City of Holts Summit, Missouri, a municipal corporation, which, territorially shall include all land within the corporate limits of the City as such limits now exist or may, from time to time, be extended or retracted.
4. Board. The governing body of the City.
5. Commission. The Planning & Zoning Commission of the City.
6. Construction Document. Includes the sketch plat, preliminary plat, final plat; and supporting drawings such as street specifications, sanitary sewer specification, storm water features, and other supporting documents. (Ord No. 1989 11-09-2009)
7. Easement. A grant by the property owner to the public, a corporation or persons, of the use of a strip of land for specific purposes.
8. May. An action which is permissive.
9. Monuments.
  - A. Lot corners. An iron pipe not less than 1" outside diameter or a reinforcing bar not less than 3/4" in diameter and not less than 30" in length set not less than 24" in the ground.
  - B. Control points. An iron pipe or reinforcing bar as described in subsection 43.020.8a set in concrete 4" in diameter and 12" in depth, or a 4" X 4" concrete post set not less than 24" in the ground with the top of the post adequately marked to define the control point. A permanent pavement marker acceptable to the P&Z Inspector may be utilized to define the centerline of right-of-way at the control points in lieu of the above described monuments.

10. Owner. An individual, firm, association, co-partnership, corporation or syndicate, or agent of any of them, having sufficient proprietary interest in any land sought to be subdivided to commence and maintain proceedings to subdivide land under the provisions of this Chapter.

11. P&Z Inspector. The Zoning Inspector of the City of Holts Summit or his authorized representative.

12. Plat. An accurate drawing or map of the land proposed to be subdivided.

A. Sketch plat. A drawing of the proposed subdivision, not necessarily to scale, but indicating the general layout of the proposed subdivision, according to the requirements of Subchapter D.

B. Preliminary plat. The preliminary map indicating the proposed layout of the total subdivision, so designated on the plat and meeting the requirements of Subchapter E.

C. Final plat. The final map of all or a portion of the subdivision, so designated on the plat and meeting the requirements of Subchapter F of this Chapter and prepared for official recording with the Recorder of Deeds of Callaway County, Missouri.

13. Streets.

A. Arterial street. A roadway used primarily for fast or heavy traffic, including all streets designated as major, thoroughfares, freeways, etc.

B. Collector street. A street used to carry traffic from residential streets to arterial streets and/or highways.

C. Residential street. A street used primarily for access to abutting property.

D. Commercial street. A street used primarily to access commercial businesses but not intended as a through street.

E. Alley or alleyway. Any street with a roadway of less than twenty feet in width. An alley shall not be considered as a primary access to any property.

14. Subdivision. The division of land into two (2) or more smaller lots, tracts, or parcels for the purpose of building development or transfer of ownership, and/or the dedication or establishment of a public street or roadway. Subdivisions shall be further classified as follows:

A. Minor subdivision. Any subdivision containing five (5) or fewer lots and not involving any new street or roadway.

B. Major subdivision. Any subdivision not classified as a minor subdivision. The term "subdivision" shall include re-subdivision and, when appropriate to the context, shall relate to the process of subdividing or the land subdivided.

15. Shall. An action which is mandatory.

### **Subchapter B -- General**

43.100. Use of unapproved plat in sale of land. No owner, or agent of the owner, of any land located within the City of Holts Summit, knowingly or with intent to defraud, may transfer, sell, agree to sell, or negotiate to sell that land by reference to or by other use of a plat of any purported subdivision of the land before the plat has been approved by the Board and recorded in the Office of the Recorder of Deeds of Callaway County. Any person violating the provisions of this section shall forfeit and pay to the City of Holts Summit a penalty not to exceed Three Hundred Dollars (\$300) for each lot transferred or sold or agreed to negotiate to be sold; and the description by metes and bounds in the instrument of transfer or other document used in the process of selling or transferring shall not exempt the transaction from this penalty. The City of Holts Summit may enjoin or vacate the transfer or sale or agreement by legal action, and may recover the penalty in such action.

1. Exception. The provision of this Chapter requiring preparation and submission of a subdivision plat shall not apply to the sale of all or a part of a recorded lot of record provided that not more than one additional building lot is being created and not involving any new streets. Both the original and the newly created lot shall meet the minimum public street frontage and the yard lot area and width requirements of the Zoning Code and shall have access to all public utilities. Whenever possible the division line between the two lots shall be a straight line. A registered land surveyor shall prepare and affix his seal to a permanent, reproducible survey document, which shall show, the boundaries of both lots, existing streets and easements and a legal description of both lots. Neither the original nor the newly created lot shall be transferred, sold, or offered for sale until both have the written endorsement of the P&Z Inspector and have been recorded in the office of the Recorder of Deeds.

2. Building permits. The P&Z Inspector shall not issue a building permit for any structure on a lot in a subdivision for which a plat has not been approved and recorded in the manner prescribed herein.

3. In any subdivision as defined in this Chapter, all new or proposed roadways shall be built according to the Street Specifications so stated in the Holts Summit City Code, regardless of the intent of the developer to dedicate the roadway to the City of Holts Summit for public use and maintenance.

43.110. Large area subdivision; general plan.

1. A subdivision may be developed in separate tracts or sections which shall be successively numbered and identified under the name of the subdivision as Section or Tract One, Two, Three, etc. In such instance, the owner shall cause to be prepared by a registered surveyor a general plan of the entire subdivision showing the approximate location of all arterial streets and/or highways, collector streets, and the public sanitary sewer and storm sewer drainage facilities contemplated and reasonably required to serve the entire subdivision.

2. When a general plan of the subdivision is required, the owner shall cause eight (8) prints thereof to be filed with the P&Z Inspector at the same time the preliminary plat of the first section or tract is filed. The P&Z Inspector shall distribute the copies of the general plan in the manner and at the time provided in Section 43.440.

43.120. Lot identification.

1. Original subdivisions. All lots in original subdivisions shall be numbered consecutively from one through the total number of lots, even though the subdivision may be recorded in sections.

2. Re-subdivisions. In re-subdivisions, all lots shall be lettered alphabetically from the letter "a" through the total number of lots.

3. Size of lots. The size of lots shall meet the minimum requirements of the Zoning Ordinance for the area being subdivided and the lots shall be arranged at right angles to street lines or radial to curved street lines, and shall front on a public street.

43.130. Variations from provisions.

1. When the Board of Aldermen determines that in a particular instance an owner cannot possibly or practically observe the requirement of any provision or provisions of this Chapter because of the presence of unusual circumstances or conditions, and that the strict application of the requirements of such provisions would either prevent, or present a serious obstacle to the formulation of a plat for the reasonable use and development of land in subdivision form the Commission may permit a written variance from the requirements of such provisions.

2. The Commission upon consideration of the facts presented with the recommendations, may permit the owner to vary from the requirements of such provisions if it determines that the intent of this Chapter is not being violated and adjoining property is not materially or adversely affected.

3. Nothing herein contained shall prevent the purchase of two or more adjoining lots and the erection of a residence within the lots when meeting all setback requirements for the perimeter of the two lots. In that event, the side line restrictions apply to the side on the extreme ends of the combined lots. **ORD #2087 (11/15/2010)**

43.140. Recordation of plats. A plat of land within the City shall not be filed and recorded until such plat has been accepted and approved by ordinance. When the approval of the City has been endorsed upon the plat and the plat has been transmitted to the Recorder as outlined in Section 43.520.7, the owner, or the agent thereof, shall have the plat recorded in the Office of the Recorder of Deeds in Callaway County, Missouri, within thirty (30) days thereof, or the City may enact an ordinance withdrawing its approval and acceptance of such plat. The owner or the agent thereof must submit a copy of the recorded plat to the City Clerk within thirty (30) days of the ordinance accepting such plat.

43.150. References. When reference is made in this Chapter to any other ordinance of the City, or any section or sections thereof, or to any statute of Missouri, the

reference shall apply to all amendments and additions to such ordinance, section or sections thereof, or statute.

43.160. Unconstitutionality clause. Should any clause, phrase, paragraph, subsection, or any other provision, or portion thereof, of this Chapter be declared invalid or unconstitutional by any court of competent jurisdiction, such holdings shall not affect any other portion of such sections as it is expressly declared that the remaining provisions and portion of these sections would have been enacted independently of such invalid portion of portions.

43.170. Penalty clause. Any person, association, partnership, corporation, or other entity who shall violate any of the provisions of this Chapter shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined not less than One Hundred Dollars (\$100) nor more than five hundred dollars (\$500) each day that a violation exists shall constitute a separate and distinct offense.

43.180. Repeal clause. All other ordinances or parts of ordinances in conflict with any of the provisions of this Chapter are hereby repealed.

### **Subchapter C -- Filing Fees**

43.200. Subdivision plats. The following schedule of fees is hereby adopted; such fees are to be paid by all persons or corporations submitted preliminary plats for approval by the Commission and shall be computed to the nearest dollar. The fee shall be paid at the time the preliminary plat is submitted to the P&Z Inspector and shall apply to the review of a preliminary sketch plat and review of the preliminary plat, improvement plans and final plat, provided that the final plat includes the same area to be subdivided as the preliminary plat.

1. Residential Subdivisions - single family. Base Fee of \$25.00 plus a fee of \$1.00 per lot.
2. RA and RD Subdivisions - multiple family residential. Base fee of \$50 plus a fee of \$1.00 per dwelling unit.
3. Commercial and Industrial Subdivisions. Base fee of \$50 plus a fee of \$1.50 per acre.
4. Maximum Fee. \$250.00

**Subchapter D -- Sketch Plat  
Submission Procedure**

43.300. Sketch plat; contents and submission procedure.

1. Contents. Data furnished in a sketch plat for a subdivision shall be as follows:

- A. Tract boundaries
- B. North point
- C. The name of the proposed subdivision, the owner, and all adjoining property owners as disclosed by the most recent tax records.
- D. All existing streets and roads, streams, and structures within the proposed subdivision and within 200 feet therefrom.
- E. Significant topographical or physical features as may be necessary or required by the Commission or P&Z Inspector.
- F. Proposed general street and sewer layout.
- G. Proposed general lot layout.

2. Submission procedure.

A. When the sketch plat being submitted is classified as a minor subdivision, the owner may bypass the preliminary plat procedure and submit a final plat as outlined in Subchapter F. The Planning & Zoning Commission may address a sketch plat and a final plat in the same meeting if the plat being submitted is classified as a minor subdivision. **(1-13-03 Ord #1422)**

B. Each developer shall submit two copies of a sketch plat to the P&Z Inspector as described in Section 43.300.1 for the proposed subdivision.

C. The sketch plat will be considered as submitted for informal discussion between the Commission and the P&Z Inspector.

D. As far as may be practical on the basis of the sketch plat, the subdivider will be informally advised of the extent to which the proposed subdivision conforms to the requirements of this Chapter.

**Subchapter E -- Preliminary Plat  
Contents and Submission Procedure**

43.400.       General.

1.       An owner who intends to subdivide land into lots for the purposes of sale and/or development or to dedicate land for streets, alleys, parks, or other public use, shall have prepared by a registered surveyor a preliminary plat of the land within the subdivision, or the section or tract thereof to be developed first prior to developing the land.

2.       As additional sections or tracts of the subdivision are desired to be developed, a preliminary plat of each section or tract shall be filed and all of the provisions of this Chapter shall be observed.

43.420.       Contents.   The preliminary plat shall be drawn to a scale of not more than 100 feet to the inch and shall show, or be accompanied by, the following information:

1.       The location of all existing property lines, north points, scale, adjoining streets and alleys, storm sewers (location and dimensions), culverts, or other underground structures and all existing or proposed easements and other existing pertinent features within the area to be subdivided and in the adjoining streets or alleys.

2.       The names of all adjoining subdivisions and property owners.

3.       The proposed lot layout and width of all streets and alleys and the zoning district or districts and of adjacent properties in which the land to be subdivided is located according to the current zoning map of the City.

4.       The title under which the subdivision is to be recorded, the name of the owners of same, including the names of the officers of any corporate owner, and the name of the registered surveyor platting the tract of land to be subdivided.

5.       The location and direction of drainage of all water courses and natural drainage channels.

6.       The proposed location of sanitary sewers

7.       Location of all flood zones

8.       Each street identified by its proposed street name

9. The location of all existing and proposed utility lines, fire hydrants, street lights and service line crossings

10. The location of proposed public sidewalks.

11. The angle of departure from one street or alley to another, except where the angle of departure is either 90 or 180 degrees. (Ord #2146 (07/11/11))

43.440. Submission procedure.

1. The owner shall submit eight (8) prints of the preliminary plat to the P&Z Inspector at least fourteen (14) days before the Planning & Zoning meeting at which approval is requested. One print shall be transmitted to each of the Aldermen representing the ward in which the proposed subdivision is located, one print to be retained by the Board, and five prints referred to the Planning and Zoning Commission, the Sewer Superintendent and the City Maintenance Superintendent for further study, investigation, and recommendation. **Ord. #1846 (3-10-08)**

A. Storm Water features, Sanitary Sewers, and Sidewalk details may be submitted on other construction documents along with the preliminary plat. When said details are included on separate construction documents, at least two sets of the supporting construction documents shall be submitted to the City. (Ord No. 1989 11-09-2009)

1-A. The City shall notify the Callaway County Water District, the Holts Summit Fire Protection District, the Callaway County Ambulance District, the Jefferson City Public Schools, and the Holts Summit Police Department in writing of the submission of a preliminary plat. The above noted agencies shall be notified that the plat is available for study from 8 am to 5 pm Monday through Friday. The City shall notify the agencies of the date, time, and place of the next regularly scheduled P&Z meeting.

2. The Planning & Zoning Commission shall notify the owner of the date, time, and place of the next regularly scheduled meeting; at such meeting, the Commission will review the preliminary plat, and the owner may appear and be heard.

3. Within sixty (60) days, or such additional period of time as the owner consents to in writing, from receipt of the plat by the P&Z Inspector, the Planning & Zoning Commission, the City Maintenance Superintendent and the Sewer Superintendent shall act upon the plat and approve, conditionally approve or disapprove same. **Ord #1846 (3-10-08)**

4. If the Planning & Zoning commission, the City Maintenance Superintendent and the Sewer Superintendent conditionally approves the plat, it shall state in writing any revisions, modifications, additions, or deletions required of the owner by the statutes of Missouri and/or Sections 43.010 through 43.300 before a final plat may be approved. Such revisions, modifications, additions, or deletions to the preliminary plat may relate:

A. To the width and/or alignment of streets.  
B. To the type, capacity, and location of sanitary sewer and/or storm sewer facilities.  
C. To the location and capacity of all public utility facilities.  
D. To the location, width, and purpose of easements appearing on the preliminary plat or required by the City for public use.  
E. Lot sizes and/or lot layout, and  
F. To such other matters as, in the opinion of the Commissions or P&Z Inspector, may be in the public interest. **Ord. #1846 (3-10-08)**

5. The Sewer Superintendent and the City Maintenance Superintendent shall submit a written report of their actions to the Planning & Zoning Commission. **Ord #1846 (3-10-08)**

6. The Planning & Zoning Commission shall submit a written report of its action on the plat to the owner and the Board of Aldermen along with a copy of the plat, indicating necessary revisions, or modifications.

7. If the owner is aggrieved with the Commission's report, the owner may appeal therefrom to the Board of Aldermen by filing a notice of appeal with the City Clerk and the Chairman of the Commission within five (5) working days from the date thereof.

A. At the next regular scheduled Board meeting, the Board shall conduct a public hearing on the issues in controversy. The Clerk shall give the owner and the Chairman of the Commission at least five (5) working days' notice of the time and place of the hearing.

B. At the first Board meeting following the public hearing, the Board shall declare its findings in writing, and enter its order approving, modifying, or rejecting the report of the Commission.

8. If the Commission fails to act on the preliminary plat within sixty (60) days, or within such additional time as the owner consents to in writing, the plat shall be considered approved and the City Clerk shall certify the approval of the Commission on the plat.

9. Approval of the preliminary plat shall authorize the owner to prepare the final plat and complete engineering designs, subject to the provisions of Subchapter F, but such approval shall not constitute an approval of the plat for purposes of recordation, or for the sale and/or development of any tract or parcel of land within the area represented by the preliminary plat.

## **Subchapter F -- Final Plat Contents and Submission Procedure**

43.500. Contents. A final plat of the subdivision, or section or tract thereof, shall be drawn on a sheet 24" X 36", to a scale of not more than 100 feet to the inch and shall contain, or be accompanied by the following information:

1. The title under which the land is to be recorded; if the plat is of a section or tract of a subdivision, the identification by section or tract number.
2. The name of the owner or owners of the land platted and, if the owner is a corporation, the names of the officers thereof.
3. The name and registration number of the surveyor and engineer registered in Missouri, who prepared the plat.
4. The classification of all land platted by zoning district classifications according to the current zoning map of the City.
5. The north point and scale.
6. The exterior boundaries of the land platted.
7. A partial map of the City at a scale of 1" = 2000', upon which shall be accurately drafted the correct location of the proposed subdivision, its boundaries and street and lot layout. (Ord. No. 2019 3-8-2010)
8. The right-of-way width of all streets and the proposed improved width of all streets.
9. The location of all flood zones
10. The location of existing building on the land platted.
11. The boundaries of all areas to be dedicated to public use, and the manner in which the areas are to be used.
12. The width, names, and lines of all streets on land adjoining the land shown on the plat.
13. In the event there are branching streets or alleys on the plat, the angle of departure from one street or alley to another except where the angle of departure is either 90 degrees or 180 degrees.

14. The dimensions of the lots, and the numbers (letters in re-subdivisions) of all lots on the plat.
15. The location and dimensions of all utility easements and drainage easements if any, on the plat.
16. All linear and angular dimensions necessary to locate the boundaries on the plat in relation to a section or quarter-quarter corner or line, or an established in-lot or out-lot line.
17. All radii, arcs and chords, points and tangency and central angles for all curves and rounded corners on the plat.
19. The location and description of all new and existing set monuments.
20. The form for dedication to public use of areas identified as right-of-way for streets, alleys, boulevards, drives, roadways of any kind, parkways, parks, sanitary sewer easements, surface water easements and public utility easements, and all other areas intended for public use, with appropriate spaces for the signatures of the owner or owners, trustee, mortgagee or mortgagees, if any, of the land platted.
21. All restrictive covenants appearing upon and applying to any lots on the final plat shall be signed by the owner or owners, trustee, and mortgagee or mortgagees, if any, of the lots.
22. A form for the approval of the Planning & Zoning Commission, the Sewer Superintendent, the City Maintenance Superintendent, and the Mayor of the City of Holts Summit, Missouri, and certification by the City Clerk. **Ord #1846 (3-10-08)**
23. The name of all adjoining property owners and subdivision. **Ord #2146(07-11-11)**

43.520. Submission procedure.

1. Within six months, or within such additional time as the owner in writing may request and the Commission may allow, from the date of approval or conditional approval of the preliminary plat of a subdivision, or section or tract thereof, the owner shall cause to be prepared by a registered surveyor and registered professional engineer and submit to the Board five (5) prints of the final plat thereof to be referred to the Commission for their review and recommendation.

A. Storm Water features, Sanitary Sewers, and Sidewalk details

may be submitted on other construction documents along with the final plat. When said details are included on separate construction documents, at least two sets of the supporting construction documents shall be submitted to the City.

2. If the owner fails to file with the Commission the final plat within the time mentioned in Section 43.520.1, the Commission shall, by written report, vacate and set aside its previous report approving the preliminary plat, and a copy of such report shall be sent to the owner and the Board. The report shall be final and unappealable.

3. The submission of the final plat shall be accompanied by five (5) prints of the proposed design of all streets, sanitary and storm sewers, sidewalks, and any other necessary appurtenances, drawn to a scale of 50 feet to the inch horizontal and 10 feet to the inch vertical.

4. The Commission shall notify the owner of the date, time, and place of The next regularly scheduled meeting; at such meeting, the Commission shall review the final plat and design plans and the owner may appear and be heard.

5. Within forty-five (45) days, or such additional time as the owner consents to in writing, from receipt of the plat and design plans by its chairman, the Commission shall act upon the plat and plans and approve, conditionally approve or disapprove same.

6. The Commission shall submit a written report of its action on the final plat and design plans to the owner and the board along with a copy of the plat indicating any necessary revisions or modifications. The owner shall be entitled to appeal the Commission report to the Board in the manner prescribed in Section 43.440.5.

7. If the Commission approves the final plat, it shall endorse its approval on the five (5) prints thereof, retain one print, and transmit one print to the owner and three (3) prints to the Board. If the Board approves the plat, the plat shall be signed by the Mayor, the Sewer Superintendent, the City Maintenance Superintendent, the Planning & Zoning Commissions, and certified by the City Clerk. In addition, the owner shall furnish the City with the original tracing and a reproducible copy of the final plat as approved. **Ord. #1846 (3-10-08)**

A. Approval of the final plat by the Board constitutes acceptance of the dedications of easements and street right-of-way as property but does not constitute acceptance of streets or other improvements for maintenance.

8. No final plat of any subdivision shall be approved unless:

A. The subdivider agrees with the Board upon an assessment whereby the City is put in an assured position to install the improvements listed in *Subsection G and Subsection H*, at the cost of the owners of property within the subdivision; or **(Ord. #1342, 4-8-02)**

B. The improvements listed below have been installed prior to such approval; or

C. The subdivider files with the Board a surety bond conditioned to secure the construction of the improvements listed below in a satisfactory manner and within a period specified by the Board, such period not to exceed two years provided, however, such bond or check shall not be accepted unless it be enforceable by or payable to the City in a sum at least equal to the cost of constructing the improvements as estimated by the City and in form with surety and conditions approved by the City Attorney; or

D. The subdivider files with the Board a cashier's check, or a certified check payable to the City of Holts Summit in an amount equal to ten (10) percent of the cost of the construction as estimated by the City of the improvements listed below. After all of the improvements have been installed in a satisfactory manner, the cashier's check or certified check shall be returned to the subdivider.

### **Subchapter G -- Construction of Improvements**

#### 43.600. Construction of Improvements.

1. Sanitary sewers. All sanitary sewers and appurtenances in this Section being developed shall be constructed according to the standards and specifications of the Missouri Clean Water Commission.

2. Utility services. Utility services shall be installed under the proposed streets prior to paving where subsurface conditions prevent pushing of services under the completed pavement. Sewer laterals shall also be stubbed in prior to street paving if the sewer main is located on street right-of-way. All such service connections shall be extended at least two (2) feet beyond the edge of pavement and shall be adequately referenced and marked for future use. All such services shall be installed in accordance with applicable codes and ordinances.

3. Streetlights. The minimum requirement for street lights shall be as follows:

A. Residential: One 9500 lumen Post Top Luminaires placed at each intersection and/or within 100 feet of a cul-de-sac, no farther apart than 300 feet.

B. Commercial: One 25,500 lumen high pressure sodium light at each street intersection and/or within 100 feet of a cul-de-sac, and no further apart than 300 feet.

C. Light Standards: Light standards shall be approved by the City Maintenance Superintendent. After acceptance by the City, the lighting will be maintained and operated at the expense of the City. **Ord. #1846 (3-10-08)**

4. Fire hydrants. In every subdivision, fire hydrants shall be located in accordance with the current specifications of the National Board of Fire Underwriters. In no case shall any platted lot be located further than six hundred (600) feet from a fire hydrant.

5. Street paving. Upon the completion of street paving, the contractor shall request in writing acceptance of the street by the City for maintenance. The City will not accept streets for maintenance until the pavement has been inspected and until all provisions of this Chapter *and Subchapter H* have been met. **(Ord. #1342, 4-8-02)**

6. Monuments. Monuments as described in Section 43.020.8 shall be installed and adequately reference to facilitate future replacement. Control point monument locations shall be verified and/or re-established after street paving has been completed and prior to acceptance of the street for maintenance by the City.

7. Sidewalks. Sidewalks shall be included on both sides of the street in any new subdivision and shall be included on the subdivision plat or supporting construction documents.

A. The subdivider shall be responsible for the construction of all sidewalks included on the construction documents.

B. Sidewalks shall be constructed within the specifications detailed in Chapter 47, Subchapter Q “Construction of Sidewalks, Curbs and Guttering, and Driveway Entrances.

C. Sidewalks, curb and gutters, and storm water features damaged during delivery or construction a specific lot shall be repaired or replaced by the owner of said lot prior to final approval of a building permit, or issuing of an occupancy permit to said owner.  
(Ord. No. 1989 11-09-2009)

### **Subchapter H -- Streets and alleys, general provisions Rights-of-way design, Specifications**

#### **43.700. Streets and alleys, general provisions.**

1. All subdivision streets shall be arranged to provide for the continuation of existing streets in adjoining subdivisions and, to the extent possible, the anticipated projections of streets through adjoining unsubdivided or undeveloped property to allow for convenient movement of vehicular traffic and the orderly development of adjoining property and shall adhere to the Major Street Plan where applicable.

2. When a new subdivision adjoins undivided lands, susceptible to being subdivided, the new streets shall be carried to the boundaries of the tracts proposed to be subdivided at a later date and a temporary turnaround shall be installed at this point.

3. Permanently designed dead-end or cul-de-sac streets shall not be longer than eight hundred (800) feet and shall be provided with a turn-around at the closed end.

A. A permanent cul-de-sac shall have a minimum right-of-way radius of fifty (50) feet, be curbed and guttered, and have a minimum paved area radius of forty (40) feet, face-to-face of curb.

B. Temporary Turnarounds

(1) A temporary cul-de-sac shall be curbed and guttered and have a minimum paved area radius of forty (40) feet, face-to-face of curb. The paved area shall be located on right-of-way and/or on a temporary street easement. The temporary street easement shall be acceptable to the P&Z Inspector and shall be vacated when the street is extended; or

(2) Omit the last twenty-four (24) feet of curb and gutter. Lay asphalt to the right-of-way lines for a temporary turn around with 5 1/2 black asphalt base and 1 1/2 Grade D asphalt. A "hammer head" turnaround must be completed into a permanent road according to the Holts Summit City Code within five (5) years from the date of construction.

4. The minimum length of a block shall be three (300) feet; the maximum length of blocks shall be one thousand (1000) feet. Blocks shall be wide enough to allow two tiers of lots except where prevented by topographical conditions, in which case the Commission may alter the size.

5. Streets shall intersect one another at as near a right angle as possible and no intersection angle shall depart from a right angle more than 20 degrees. Residential street intersections shall be rounded with a radius of 15' for right angle intersections.

6. All streets in exact or approximate alignment with existing named streets shall bear the names of such existing named streets. All other streets shall be assigned names which do not conflict with names of existing streets. Postal addresses for each lot shall be assigned by the City Clerk.

7. Whenever there exists a platted half street or half alley adjacent to land platted for a subdivision, the remaining half of the street or alley shall be provided for on the plat of the subdivision.

8. The width of utility easements shall be as determined by the P&Z Inspector, but not less than twenty (20) feet.

9. When building permits have been issued for ninety (90) percent of the lots in a recorded subdivision, no additional permits shall be issued until all of the improvements required by this Chapter have been installed and accepted for maintenance by the Board of Aldermen. (Ord. #1342, 4-8-02)

10. Subdividers may request in writing acceptance of the street by the City for maintenance. Formal written acceptance of streets by the City shall be required prior to the City assuming maintenance. Street signs will be installed once the street is paved and the first building permit is issued on that block. A small sign indicating "Street not accepted by City" should be posted and remain in place until the street is accepted by the City for maintenance.

A. New streets in approved subdivisions shall not be accepted by the City for maintenance until 75% of the construction on lots located on said subdivision plat has been completed.

B. New streets in approved subdivisions shall not be accepted by the City for maintenance until all sidewalks included in the subdivision construction documents have been completed.

C. New streets in approved subdivision shall not be accepted by the City for maintenance until after being inspected by the City Building Inspector who after conducting said inspection shall report to the Board of Aldermen all defects to said streets and sidewalks have been repaired, and the Board of Aldermen accept said streets by ordinance.

(Ord. No. 1989 11-09-2009)

11. Monuments as described in Section 33-2 shall be installed and adequately referenced to facilitate future replacement. Control point monument locations shall be verified or re-established after street paving has been completed and prior to acceptance of the street for maintenance by the City.

12. The developer shall be held responsible for any and all defective workmanship for a period of one year from the date of the acceptance of the improvements described herein.

43.720. Streets and alleys; right-of-way, design.

1. The widths of right-of-way for streets and alleys and the improved width of roadways within such rights-of-way, unless modified by the Board of Aldermen because of unusual conditions or circumstances are established as follows:

A. Arterial streets. The right-of-way shall be at least eighty feet (80) wide and the improved roadway shall be at least thirty-seven (37) feet wide (face-to-face of curb).

B. Collector streets. The right-of-way shall be at least sixty (60) feet wide.

(1) If parking is designed for both sides of the street, then the improved roadway shall be at least thirty-nine (39) feet wide (face-to-face of curb).

(2) If parking is designed for one side of the street, then the improved roadway shall be at least thirty-two (32) feet wide (face-to-face of curb), and the no parking signs shall, if feasible, be placed on the inbound side of the roadway.

C. Commercial Streets. The right-of-way shall be at least sixty (60) feet wide.

(1) If parking is designed for both sides of the street, then the improved roadway shall be at least thirty-nine (39) feet wide (face-to-face curb).

(2) If parking is designed for one side of the street, then the improved roadway shall be at least thirty-two (32) feet wide (face-to-face of curb), and the no parking signs shall, if feasible, be placed on the inbound side of the roadway.

(3) If parking is designed for neither side of the street, then the improved roadway shall be at least twenty-nine (29) feet wide (face-to-face of curb).

D. Residential streets. The right-of-way for a residential street shall be at least sixty (60) feet wide.

(1) If parking is designed for both sides, then the improved roadway shall be at least thirty-four (34) feet wide (face-to-face of curb).

(2) If parking is designed for one side, then the improved roadway shall be at least twenty-nine (29) feet wide (face-to-face curb), and the no parking signs shall be placed, if feasible, on the inbound side of the roadway.

E. Alleys. The right-of-way for an alley shall be at least twenty-four (24) feet wide and the improved roadway shall be at least twenty (20) feet. An alley shall not be considered as a primary access to any property. All alleys shall be designated for no parking on either side of the street.

43.740. Specifications and design. The minimum street slab thickness shall be six (6) inches Portland Cement concrete or five (5) inch black base with two (2) inch Type "C" asphaltic concrete (Missouri State Highway Specifications) with Portland Cement concrete curb and gutters. Residential street intersections shall be rounded with a radius of fifteen (15) feet for right angle intersections. All other intersections radii shall be as approved by the P&Z Inspector and the Commission. All developers shall be required to meet this minimum requirement regardless of the street classification. Additional design requirements above the minimum specified herein shall be the responsibility of the City.

## Subchapter I -- Street Specifications

43.800. Purpose. The purpose of the specifications is to provide for consistency and quality in commercial and residential development in the City of Holts Summit, Missouri. All such development work shall conform to these specifications and shall be subject to inspection by the City Maintenance Superintendent or his representative. Contractors performing any work under the control of these specifications shall notify the City Maintenance Superintendent at least twenty-four (24) hours in advance of beginning work or of performing any critical activity within the work.

43.810. Definitions. As used in this Subchapter, the following words, terms, and phrases shall have the following meanings:

1. Contractor. Any individual or organization engaged by the developer to perform work in conjunction with the development of the real estate subdivision.
2. Developer. The owner or owner's representative responsible for the development of a real estate subdivision.
3. Engineer. The developer or owner's designated registered professional engineer or the duly appointed representative of the engineer.
4. City Engineer. The Engineer for the City, or their authorized representative.
5. City Maintenance Superintendent. A duly authorized representative of the City having the right to make such inspections or tests as may be deemed necessary at the plant of the contractor or of his suppliers, or on the job site.
6. Plans. All drawings and computations necessary for the construction of the streets and drainage facilities in the real estate subdivision, as prepared by the Engineer and approved by the Planning and Zoning Commission.
7. Typical Sections. Pavement sections shown on the City Standard Drawings, Addendum A, which are attached to these specifications and made a part thereof.

43.820. Earthwork. This work shall include all labor, material, equipment, and services necessary to complete all earthwork as shown on the plans and specifications herein including roadway excavation, embankment, sub-grade preparation and finish grading.

1. The term, "roadway", as used in this Section, is defined as including roadways, roadway intersections, sidewalks, shoulders, cut and fill slopes, driveways, parking areas and all other areas of earthwork except excavation and backfill for pipe trenches and structures.

2. Missouri Highway Specifications Section 203 shall govern all earthwork for roadway except as modified in the form of additions, deletions, and substitutions in this Subsection. Where any part of said Section of the Missouri Highway Specifications is so modified, the unaltered provisions shall remain in effect.

3. Compaction of all roadway embankments shall be in accordance with Section 203.4 of the Missouri Standard Specifications for Highway Construction.

4. Unsuitable excavated material shall not be used in the embankments and shall not be disposed of on right-of-way. Disposal shall be the sole responsibility of the contractor.

5. Special care shall be taken to clean out all debris and organic matter from existing ditches to be filled. The ditches shall be carefully backfilled in accordance with the requirements herein, using trench rollers or hand-operated power compactors as may be needed to assure proper compaction throughout.

6. In rock cut areas, excavation shall be carried to twelve (12) inches below sub-grade to a minimum distance of two (2) feet behind back of curb or to the in-slope of a ditch section. Backfilling of undergraded cut areas shall be with a drainable material with top surface choked with fines for proper sub-grade preparation. Undrained pockets shall not be left in the surface of the rock.

7. The contractor shall be completely responsible for producing a firm unyielding sub-grade. The contractor shall perform all necessary work and take any necessary steps to stabilize the sub-grade.

8. The contractor shall protect the sub-grade by not allowing delivery vehicles of excess weight thereon and by varying the path of delivery vehicles so as to not cause excessive rutting. Heaving or rutting damage to sub-grade caused by delivery vehicles during the paving operations shall be immediately repaired and brought back to specified elevation prior to paving.

9. The top four (4) inches of backfill behind curbs shall be topsoil, free from rocks, gravel, and any undesirable materials and shall be material suitable to establish a seed bed. This material may be either topsoil available within the limits of the project or it may be topsoil furnished by the contractor.

43.830. Trenching, Embedment, and Backfill for Pipe or Culvert Pipe.

1. See "Standard Details". This section covers the backfill from top of granular fill to top of pipe.

A. Backfill as soon as possible to minimize the possibility of damage to joints and inconvenience to the public.

B. Material to be selected earth or granular fill material, free from sod, sticks, roots, or rocks over one (1) inch size, to be unfrozen, and to be of proper moisture content for specified compaction. Suitable material from the project excavation shall be brought in from elsewhere on the work where required.

C. Place alongside pipe in loose layers of six (6) inch maximum thicknesses, thoroughly compacting each layer. Take special care to place and compact material around the pipe so as to leave no voids and to provide uniform lateral support for the pipe. Bring materials up uniformly on both sides of pipe, taking special care with corrugated metal pipe.

D. The material shall be compacted to the same density as required for backfill above top of pipe.

E. At his option the contractor may supply and place granular fill material to the top of the pipe in lieu of the compacted earth fill.

2. Backfill Above Top of Pipe or Culvert Pipe. Backfill from top of pipe to original surface or to sub-grade where pavement is to be placed is covered by this Section.

A. Materials.

(1) Material for backfill above top of pipe shall be the same for backfill below top of pipe as specified in Subparagraph 48.103.1.B. Material that is more suitable shall be brought from elsewhere on the project if necessary and the unsuitable material disposed of. If the specified compaction cannot be obtained with earth excavated from the trench, the contractor shall use granular fill or similar approved material.

(2) Rock larger than one (1) inch shall not be placed within three (3) inches of pipe. Rock larger than eight (8) inches shall not be placed within two (2) feet of the top of pipe. No rock larger than two (2) inches may be placed in the upper six (6) inches under pavement sub-grade. No rock may be placed in the upper twelve (12) inches of trenches through grass parkways or earth areas.

(3) Large stones may be placed in the remainder of the backfill only if well separated and so arranged that no interference with the specified backfill will result.

B. Methods.

(1) Method of backfill used shall not impose excessive concentrated or unbalanced loads, shock, or impact on, or cause displacement of the pipe. The backfill shall be slowly rolled down a slope at the end of the trench and shall not be pushed over the side of the trench.

(2) Consolidated material weighing more than one hundred (100) pounds shall not be permitted to fall more than three (3) feet into the trench unless cushioned by at least three (3) feet of backfill over top of pipe.

43.840. Specifications and Design. The minimum street slab thickness shall be six (6) inches Portland Cement concrete or five (5) inch black base with two (2) inch Type "C" asphaltic concrete (Missouri State Highway Specifications) with Portland Cement concrete curb and gutters. Residential street intersections shall be rounded with a radius of fifteen (15) feet for right angle intersections. All other intersections radii shall be as approved by the City Maintenance Superintendent and the Commission. All developers shall be required to meet this minimum requirement regardless of the street classification. Additional design requirements above the minimum specified herein shall be the responsibility of the City. All roads shall have a 2% crown to provide for positive drainage.

43.850. Asphaltic Concrete Base Weather Limitations.

1. Bituminous mixtures shall not be placed,
  - A. When either the air temperature or the temperature of the surface on which the mixture is to be placed is below 40 degrees F., (except that base courses three (3) inches or more in thickness may be placed when the air temperature is 35 degrees F.),
  - B. On any wet or frozen surface, or
  - C. When weather conditions prevent the proper handling or finishing of the mixture.
2. Mixtures shall not be placed during inclement weather.

43.860. Asphaltic Concrete Base Compaction.

1. Rolling shall begin as soon as practicable after the spreading. The contractor shall submit to the City Maintenance Superintendent the rolling system he proposes to use for the compaction of the mixture. Rollers shall be in good condition, capable of operation without backlash. Steel wheel rollers shall be equipped with scrapers. All rollers shall have a functioning water system for moistening each roller or wheel.
2. Base course shall be compacted to 95% of laboratory density. Surface course shall be compacted to 98% of laboratory density.

43.870. Asphaltic Tack Coat.

1. A tack coat will be required over all existing pavement to be overlaid and between each lift of the new asphaltic concrete pavement unless the preceding lift has been protected from all dirt and traffic since its placement.

2. Tack coat will be placed after cleaning and preparing of the surface is complete. Application rate will generally be 0.10 and 0.15 gallon per square yard as directed by the City Maintenance Superintendent. Tack coat material shall be RC-70, SS-I or SS-IH unless otherwise approved by the City Maintenance Superintendent.

43.880. Poured-In-Place Concrete.

1. Description:

A. Place, finish, protect, and cure, poured-in-place concrete as indicated and specified.

B. The Contractor shall furnish all labor, materials, equipment, and services necessary to complete the Portland Cement concrete work as indicated on the drawings or as directed by the City Maintenance Superintendent. The Contractor shall repave all street crossings due to construction cuts. The Contractor shall repave all driveways damaged due to construction cuts.

2. Submittals:

A. Shop drawings shall be submitted showing placement of reinforcing steel for all structural concrete pours such as but not limited to footings, columns, walls and beams, unless waived in writing by the City Maintenance Superintendent.

B. Submit slips to the City Maintenance Superintendent, at time of delivery of each load of concrete, stating actual quantity of each ingredient in that load, amount and strength of concrete.

3. Quality Assurance:

A. All concrete site-mixed or ready-mixed and produced by plant shall be acceptable to the City Maintenance Superintendent.

B. No concrete shall be used prior to acceptance of cement mill test reports, aggregate samples, and mix proportions.

C. Use of admixtures NOT PERMITTED unless approved in writing by the City Maintenance Superintendent.

D. Use of ready-mixed concrete permitted, provided City Maintenance Superintendent has right to inspect plant of manufacturer and observe proportioning and mixing of concrete, and is given every facility thereof, and that materials and methods of proportioning, mixing, and delivering are satisfactory and generally in

accordance with specifications.

E. 3000 psi concrete shall be used for all concrete not otherwise specified or noted on drawings and may be used in lieu of 1500 psi concrete.

F. 1500 psi concrete may be used where so indicated on drawings or specified.

G. Methods of protecting concrete during adverse weather shall be acceptable to City Maintenance Superintendent.

H. Dispatch trucks from batching plant so they arrive at work site just before concrete is required, thus avoiding excessive mixing of concrete while waiting, or delays in placing successive layers of concrete in forms.

4. Materials.

A. Quality and proportioning of concrete.

(1) Proportion materials for concrete to produce a thoroughly workable, plastic mixture resulting in a dense watertight concrete, with limitations given in Table A as follows:

	Class		
	4000 psi	3000 psi	1500 psi
Minimum compressive strength at 28 days in pounds per square inch	4,000	3,000	1,500
Maximum net water content per bag of cement in gallons (decrease if possible)	5.75	6.25	8
Minimum quantity of cement per cubic yard of concrete in bags (increase if necessary to meet other requirements)	6.5	5.75	4.5
Maximum Slump (inches)	3.5	4	N/A

5. Determining Proportions: Determine by trial, at site, proportions of cement, fine and coarse aggregate, and water used to obtain specified concrete. Vary proportions as permitted, and vary as required, provided that resulting mix does not violate limitations set forth above under heading "Quality and Proportioning on Concrete".

6. Consistency of Concrete: Plastic consistency, readily worked into all parts of forms and around embedded work without segregation of constituent materials or collection of free water on surface.

7. Measuring Materials: Cement, fine aggregate, coarse aggregate, and water for concrete measured separately and with accuracy. Take particular care that fractional bags of cement are correctly measured. Aggregates measured by weight or loose in suitable boxes, with allowance as directed for bulking of sand. Water measured by volume.

8. Mixing Concrete:

A. Mix in suitable batch mixer of adequate capacity, except for small quantities which, by permission, are hand mixed. Volume of mixed batch not to exceed manufacturer's rated capacity of mixer. Provide adequate facilities for accurate measurement of water and control of materials entering drum. Revolve mixer at uniform peripheral speed of about 200 fpm.

B. Minimum 1-1/2 minutes mixing time for each batch (from time when all solid materials and water are first in drum) for mixers of one cubic yard capacity or less; for mixers of larger capacity, mixing time increased thirty second for each additional half cubic yard or fraction thereof. Entire batch shall be discharged before mixer is recharged.

C. Hand mixing shall be done on suitable surface. Cement and aggregates mixed dry until an even and uniform color has been attained throughout. Proper quantity of water may then be added and whole mass turned with square-edged shovels until becoming intimately mixed.

9. Ready-Mixed Concrete:

A. Quantity of concrete to be mixed or delivered in any one batch not to exceed rated capacity of mixer or agitator as stated on nameplate for the type of mixing in use.

B. Concrete discharged into forms within 1-1/2 hours after cement was first added to mix, and be mixed within five minutes after all water has been added.

10. Forms:

A. Constructed of sound lumber, plywood, or metal, and conforming accurately to dimensions, shapes, and elevations indicated on drawings. Forms mortar tight, rigid, and unyielding during placing and compacting of concrete. Forms for manhole inverts, smooth, and carefully built to true size and shape, and accurately set.

B. Suitable molding or bevels so placed to produce a 3/4-inch chamfer on all exposed projecting corners.

11. Reinforcing Steel:

A. Bars: ASTM A615, deformed, Grade 60.

B. Welded Wire Fabric: ASTM A185 or A497.

C. Bar Supports: CRSI Class 1 plastic protected or Class 2 stainless steel protected.

12. Premoulded Expansion Joint: The premoulded expansion joint material shall be 1/2-inch gray rubberized material. Premoulded expansion joint shall be installed to the full depth of the joint and in accordance to the manufacturer's instructions.

13. Concrete Adhesive: Where indicated on the drawings or requested by the City Maintenance Superintendent, Tiger-grip brand, Acryl-60, or equal adhesive shall be used.

14. Mixing:

A. Ready Mix (Central Plant) concrete shall be used for all work, provided the concrete conforms to the proportions and strengths as specified herein. Two speed mixer trucks shall be utilized for transit to the job site.

B. The concrete must be in place within forty-five minutes after water is added to the mix. A.S.T.M. Specifications for Ready Mix Concrete C-94 shall apply. Central Mixing Plant shall be designated in writing to the City Maintenance Superintendent for his approval one week prior to the usage of concrete on the job site.

15. Construction Methods.

A. Forms:

1) The forms utilized for concrete shall be watertight, true to line and elevation, and rigidly braced so as not to be disturbed during the placement of concrete. If the forms develop any defects such as bulging, sagging, or showing signs of lateral displacement after the concrete has been placed, the concrete shall be removed and replaced correctly at the Contractors expense. The inside of all forms shall be coated with a light, clear, paraffin based oil, which will not discolor or otherwise mar the concrete surface. The oil will be applied prior to erection of the forms; any reinforcing steel contaminated with form oil will be removed and replaced.

B. Forms for concrete surfaces which will be visible in the finished structure shall be lined with wooden sheets such as masonite or smooth plywood. The joints of this lining shall be neat and close. Lining damage with hammer imprints shall not be used.

C. Removal of forms shall be restricted to the following minimum time requirements:

Structural slab	120 hours
Slab on grade	48 hours
Walls	48 hours

D. The minimum times, shown above, shall be utilized unless specific instruction to increase this time period have been requested by the City Maintenance Superintendent.

E. Form ties shall be of the removable end, permanently embedded body type and shall have sufficient strength, stiffness, and rigidity to support and maintain the form in proper position and alignment without the use of auxiliary spreaders.

F. Chamfer strips shall be place din forms to bevel all salient edges and corners except the top edges of walls and the edges which are to be tooled. Unless otherwise noted, bevels shall be 3/4 inch wide.

16. Embedded Work in Concrete: Build all embedded work accurately into, or encased in, masonry as directed, and take all necessary precautions to prevent work from being displaced or deformed.

17. Placing Reinforcement:

A. Reinforcement shall be accurately formed and positioned, and shall be maintained in proper position while the concrete is being placed and compacted. Unless otherwise shown on the Drawings, the details of fabrication shall conform to ACI 315 and 318. In case of conflict, ACI 318 shall govern.

B. Approval by the City Maintenance Superintendent is required at the completion of placing reinforcing steel prior to the placing of any concrete.

18. Placing Concrete.

A. Insure that forms and excavations are free from water and all dirt, debris, and other foreign matter when concrete is placed.

B. Use metal or metal lined chutes for conveying concrete, if indicated.

C. Deposit concrete in suitable layers, one layer quickly following another, until placement has been completed. Compact concrete thoroughly while being deposited by rodding and spading or by mechanical vibration. Concrete consistency, as measured by slump, shall not exceed three inches if mechanical vibration is used. Experienced operators under close supervision shall perform vibration, with the duration held to minimum necessary to produce thorough compaction without segregation. Use hand spading, always adjacent to forms to produce a smooth, dense surface. Concrete shall be rodded thoroughly and carefully about embedded materials.

D. The placing of concrete shall be accomplished by placing in one continuous operation between the limits of the work or between properly constructed and permissible construction joints.

E. Place no concrete over water covered, muddy, frozen soil or dry soil or sub-base. Dry sub-base shall be sprinkled with water prior to the placement of concrete.

F. In preparation for the placing of concrete, all chips and other construction debris and extraneous matter shall be removed from the interior of the forms. Struts, stays and braces, serving temporarily to hold the forms in correct shape and alignment pending the placing of concrete in their locations, shall be removed when the concrete placing has reached an elevation rendering their services unnecessary. These temporary members shall be entirely removed from the forms and not buried in the concrete. Concrete shall be placed so as to avoid segregation of the materials and displacement of the reinforcement. The use of long troughs, chutes, and pipes for conveying concrete from the mixer to the forms shall be permitted. In case an inferior quality of concrete is produced by the use of such conveyors, the City Maintenance Superintendent may order discontinuance of their use and the substitution of a satisfactory method of placing.

G. Open troughs and chutes shall be of metal or metal lined; where steep slopes are required, the chutes shall be equipped with baffles or be in short lengths that reverse the direction of movement.

H. All chutes, troughs, and pipes shall be kept clean and free from coatings of hardened concrete by thoroughly flushing with water after each run; water used for flushing shall be discharged clear of the structure.

I. When placing operations would involve dropping the concrete more than five feet, it shall be deposited through sheet metal or other approved pipes. As far as practicable, the pipe shall be kept full of concrete during placing and their lower ends shall be kept buried in the newly placed concrete. After initial set of the concrete, the forms shall not be jarred and no strain shall be placed on the ends of reinforcement bars which project.

J. During the placing of the concrete it shall be compacted by mechanical vibration obtained by mechanical power operating within the mass of the concrete, supplemented by spading tools. Vibrators shall be of a type and design approved by the City Maintenance Superintendent.

K. The intensity of vibration shall be such as to visibly affect a mass of concrete of one-inch slump over a radius of at least eighteen inches. The Contractor shall provide a sufficient number of vibrators to properly compact each batch immediately after it is placed in the forms. Vibration shall be manipulated so as to thoroughly work the concrete around the reinforcement and embedded fixtures and in the corners and angles of the forms. Vibration shall be applied at the point of deposit and in the areas of the freshly deposited concrete.

L. The vibrators shall be inserted and withdrawn out of the concrete slowly. The vibration shall be of sufficient duration and intensity to thoroughly compact the concrete, but shall not be continued so as to cause segregation of aggregate. Vibration shall not be continued at any one point to the extent that localized areas of grout are formed.

M. Vibrations shall not be applied directly or through the reinforcement to sections or layers of concrete which have hardened to the degree that the concrete ceases to be plastic under vibration. It shall not be used to make concrete flow in the forms over distances so great as to cause segregation, and vibrators shall not be used to transport concrete in the forms.

N. Vibration shall be supplemented by such spading as is necessary to ensure smooth surfaces and dense concrete along form surfaces and in corners and locations impossible to reach with the vibrators.

19. Curing and Protection:

A. Do not permit water to rise on concrete within twenty-four hours after it is placed, nor allow running water to flow over completed concrete within four days after it has been placed.

B. Wet cure and protect all concrete for at least seven days after having been placed, so that temperature at surface will not fall below 50 degrees Fahrenheit.

C. Curing shall be accomplished by preventing loss of moisture, rapid temperature change, and mechanical injury or injury from rain or flowing water for a period of not less than five days when normal Portland Cement has been used. Curing shall be started as soon as free water has disappeared from the surface of the concrete after placing and finishing. Curing shall be accomplished by using any of the following methods or combination thereof, as approved by the City Maintenance Superintendent.

D. Unformed surfaces shall be covered with approved fabric, mats, burlap, or with sand, and shall be kept continually wet, or be covered with waterproof paper or polyethylene sheeting, or be coated with liquid membrane. Where formed surfaces are cured in forms, the forms shall be kept continually wet or the top forms may be loosened, as directed or approved by the City Maintenance Superintendent and water allowed to run down between the forms and concrete. If forms are removed before the end of the curing period, curing shall be continued as on unformed surfaces. Burlap shall be used only on surfaces which will be exposed in the finish work and shall be in two layers. Water shall be applied in a manner which will not damage the concrete, and shall be free from impurities which may damage or discolor the concrete.

E. Liquid membrane-forming curing compounds, when approved by the City Maintenance Superintendent, shall be applied by power spraying equipment using a spray nozzle equipped with a wind guard. The compound shall be applied in a two-coat, continuous operation at a coverage of not more than 200 square feet per gallon for each coat as recommended by the manufacturer. The compound shall form a uniform continuous, adherent film that will not check, crack, or peel and shall be free from pinholes or other imperfections. Surfaces subject to heavy rainfall within three hours after application of compound shall be re-sprayed at the rate specified above. Surfaces coated with curing compound shall be kept free of foot and vehicle traffic or other abrasions during the curing period. Membrane curing compound shall not be used on surfaces that are to receive concrete, bituminous membrane waterproofing, resilient floor covering, nor surfaces that are to be painted.

F. Waterproof paper or polyethylene sheeting shall be placed to completely cover the concrete with enough overlap for secure anchorage around the edges. Adjoining sheets shall be lapped six inches and appropriately weighted, or sealed with tape or other approved means. Edge and lap anchorage shall be sufficient to prevent billowing or displacement by the wind. The sheeting material shall not be less than four mils thick and black in color for cold weather use and white or clear for hot weather.

G. To facilitate rubbing of concrete, or for other reasons, forms may be removed from vertical surfaces of thick sections forty-eight hours after concreting, with the approval of the City Maintenance Superintendent. Extreme caution should be exercised to prevent injury of concrete surfaces and edges during form removal. Surfaces revealed by form removal before the five day curing period shall have one of the other curing methods applied as soon as possible after form stripping.

## 20. Finishing Concrete:

A. Smoothly finish manhole tables and all surfaces shaped without forms and over which liquids will flow by means of a steel trowel, without use of additional cement or sprinkling with water. Do not start trowelling until all water has disappeared from surface. Avoid over-trowelling.

B. Immediately after removing the forms, all fins or irregular projections shall be removed from all surfaces exposed above ground. On all surfaces the area of cavities produced by form ties, holes, honeycombing, broken edges or corners, and other surfaces defects, shall be cleaned and carefully filled, pointed, and trowelled to a true uniform smooth surface with sand-cement mortar mixed in the proportions used in the grade of concrete being furnished. Defective concrete as determined by the City Maintenance Superintendent shall be repaired by cutting out the unsatisfactory material and placing new concrete which shall be secured with keys, dovetails or anchors. Concrete for patching shall be drier than the usual mixture and shall be thoroughly tamped into place.

C. No mortar wet cement shall be used in finishing except the mortar necessary to fill imperfections. Edging tools shall be used on all exposed top edges.

D. The top surface of walls, where exposed, shall receive a smooth trowelled finish. Where the top surface joins the sides, a 3/4 inch chamfer shall be provided.

## 21. Cold and Hot Weather Requirements.

A. Cold Weather. Cold weather concreting shall not be continued when the air temperature is below 45 degrees Fahrenheit, unless the following conditions are maintained:

1) Mixing water shall be heated to a maximum of 150 degrees Fahrenheit.

2) Aggregates shall be heated until free of all ice and frost.

3) The concrete temperature after mixing shall be between 50 degrees Fahrenheit and 70 degrees Fahrenheit if the air temperature is 25 degrees Fahrenheit to 45 degrees Fahrenheit.

4) After the concrete is placed, it shall be covered, protected and heated so as to maintain a minimum of 70 degrees Fahrenheit air temperature for the first twenty-four hours and 50 degrees Fahrenheit for the next six days.

5) Moist conditions shall be maintained during the heating period.

6) All covering, heating equipment, etc., shall be on hand and approved by the City Maintenance Superintendent before any concrete is placed.

Admixtures, such as calcium chloride, shall be used only with the approval of the City Maintenance Superintendent.

No concrete shall be placed on iced or frozen subgrade or when the air temperature is below 25 degrees Fahrenheit.

B. Hot Weather. Hot weather concrete work will not be permitted on exposed surfaces while air temperature exceed 100 degrees Fahrenheit. Cover and protect and cool as necessary to maintain the internal temperature of the concrete below 200 degrees Fahrenheit. Concrete delivered to the job site while in the Ready Mix truck shall maintain a temperature less than 85 degrees Fahrenheit.

22. Trimming and Repairs.

A. Minimize trimming and repair work on forms and concrete.

B. Cut defective concrete normal to surface until sound concrete is reached, but not less than one inch deep cavity; rough and clean remaining concrete thoroughly. Wet concrete around cavity or form-tie recess thoroughly and promptly paint with 1/16 inch brush coat of neat cement mixed to consistency of thick lead paint. Fill hole with mortar mixed in proportions of one part cement and 2-1/2 parts sand, both being from same sources as in parent concrete.

23. Samples and Test.

A. Samples and test shall be provided by the Contractor for test purposes, one set of four cylinders taken from each day's concrete mix. The test cylinders shall be made, cured, and stored in conformity with A.S.T.M. Specifications C192, and tested in conformity with A.S.T.M. Specifications C39. Two cylinders shall be broken at seven days and two cylinders at twenty-eight days, at the Owner's expense by the City Maintenance Superintendent.

B. The Contractor shall accept the City Maintenance Superintendent tests results.

43.890. Portland Cement Concrete.

1. Description. This section describes the concrete and materials that shall be used in all concrete work.

2. Related Work:

A. Section 02520 - Portland Cement Concrete Paving

B. Section 03301 - Poured-In-Place Concrete

C. Section 03401 - Manholes - Precast

3. References:

A. ASTM C33: Standard Specification for Concrete  
Aggregates.

B. ASTM C40: Standard Test Method for Organic Impurities  
in Fine Aggregates for Concrete.

C. ASTM C150: Standard Specification for Portland Cement.

4. Submittals:

A. Submit the following:

1) Furnish sworn certificates, if required, of cement mill tests, in triplicate, and at least seven days before cement will be used. Owner reserves right to make independent tests at any time.

2) Submit clearly labeled samples of fine and coarse aggregates to the City Maintenance Superintendent, as required. Aggregates delivered and used and equal to accepted samples in all respects.

3) For ready-mix concrete, furnish by manufacturer through contractor, appropriate certificates of tests, materials, proportions, mixing, and strengths from an independent testing laboratory. Effective date of certification not more than six months prior to time when concrete will be used and forwarded to City Maintenance Superintendent at least seven days before time of use. Do not order ready-mixed concrete before City Maintenance Superintendent has given permission.

5. Portland Cement.

A. The Portland Cement shall conform to A.S.T.M. Specifications C-150, Type I or A.S.T.M. Specification C-175, Type IA air entrained cement, or if approved by the City Maintenance Superintendent, Type II or Type III.

B. The Portland cement used under this contract shall be a standard brand of Portland cement which has been in practical use in public works and which has heretofore given satisfactory results. The cement when delivered to the site or at the location where the concrete is to be mixed, shall be stored so as to protect it from damage; and no damaged, partially set, or lumpy cement shall be used in the work and shall immediately be removed from the premises. The cement shall be manufactured by only one mill and used throughout the entire project. Brands of cement shall not be mixed.

6. Fine Aggregate.

A. The fine aggregate shall consist of clean, natural sand of hard, strong, durable material, free from all foreign organic material or other injurious impurities conforming to A.S.T.M. C-33. The sand shall be graded to meet the following sieve analysis using the U.S. Standard sieve series, with all percentages determined by weight.

SIEVE SIZE	PERCENT PASSING
3/8 inch	100
No. 4	95-100
No. 16	60-75
No. 50	10-30
No. 100	0-5

The fineness modulus of the fine aggregate shall not be less than 2.50 nor more than 3.00.

B. Fine aggregate shall be acceptable if contents have two percent or less of silt which shows a color no darker than Organic Plate No. 2 when tested according to ASTM C40.

C. Weighted average loss not to exceed ten percent when fine aggregate is subjected to five cycles of soundness test, using magnesium sulfate conforming to ASTM C33.

7. Course Aggregate.

A. The coarse aggregate shall be clean washed and screened gravel or crushed limestone, having a specific gravity of not less and 2.56. The gravel shall be free from dust, loam, clay, alkali, or organic impurities, and free from thin porous, elongated, or laminated particles. A sample of the gravel when subjected to the sodium sulphate accelerated soundness test for freezing and thawing shall have a weighted average loss of not more than 15%. Crushed limestone aggregate shall consist of uncoated particles of sound, durable rock of uniform quality without an excess of flat, elongated, or laminated pieces.

B. The gravel or crushed limestone shall be graded to meet the following sieve analysis using the U.S. Standard Sieve Series, with all percentages determined by weight.

SIEVE SIZE	PERCENT PASSING
1-1/2 inch	100
1 inch	95-100
3/4 inch	70-85
3/8 inch	20-40
No. 4	0-5

C. The use of frozen aggregates will not be permitted. When the temperature of the air permits concreting to be carried on, the aggregates must be thawed out, thoroughly removing all frost before inclusion in the concrete mixture.

8. Water. The water in mixing concrete shall be clean and free from injurious amounts of oil, acids, alkalis, salts, or organic matter. The water used shall be of potable quality.

9. Admixtures. Should the Contractor desire to incorporate in the concrete mix an admixture to improve the work ability of the concrete, the approval must be obtained from the City Maintenance Superintendent. However, no additional payment will be made for the use of the admixture; the use of such admixture will be made at the Contractor's expense.

A. For plasticizing, consider using "Pozzolith" by Master Building Company, WR-77 by Chem Masters Corp., or equal.

B. For air entraining, consider using "Darex" Dewey and Almy Chemical Company, "Adz-Air", Chem Masters Corp., or equal.

10. Grout. The grout where indicated on the drawings shall be composed of one part Portland cement to two parts clean sand by volume to which shall be added one level teaspoon of unpolished aluminum powder per sack of cement. Water shall be added only in the amounts sufficient to permit placing.

43.900. Seeding and Erosion Control. All disturbed areas not to be paved shall be seeded in accordance with the following. Fescue seed meeting the requirements of the Missouri Seed Law shall be applied at a rate of not less than two (2) pounds per 1,000 square feet. If proper growth is not obtained as a result of the initial seeding, additional applications of seed will be required until satisfactory results are obtained.

43.910. Waste Fill. Any extra fill material produced by the earthwork for this project and not required for the construction of the project shall be disposed of off the site of the work by the contractor within 48 hours after completion of the project. Arrangements for waste fill sites shall be the responsibility of the contractor and/or developer.

### DIAGRAM OF DRIVEWAY ENTRANCE

