City of Osage Beach

Code of Ordinances & Design Guidelines PROPOSED CHANGES

Enclosed for Review:

Chapter 100, Section 100.200 Design Guidelines

Chapter 410, Article IV Design Standards, Article V Improvements, Article VI Storm Water and Drainage, Article VII Street Lighting

Design Guidelines Section 4 – Storm Drainage

Design Guidelines Section 6 – Road Cut, Utility Trench and Excavation Permit

Public Comment Deadline: Friday, September 29, 2023

Comments may be submitted to the Office of the City Clerk by email, mail, or in-person drop off.
Email: tberreth@osagebeach.org; Mail or Drop Off: 1000 City Parkway, Osage Beach, MO 65065

Posted Friday, August 25, 2023

City of Osage Beach

Code of Ordinances

Chapter 100, Section 100.200 Design Guidelines

City of Osage Beach

Code of Ordinances

Chapter 100 / Article V
Design Guidelines

Section 100.220 **Design Guidelines.**

A certain document, one (1) copy of which is on file in the office of the City Clerk, being marked and designated as the Osage Beach Design Guidelines, is hereby adopted as the code of the City of Osage Beach, Missouri, for regulating the design, construction, quality of materials, erection, installation, alteration, repair, location, relocation, replacement, addition to, use or maintenance of various systems and improvements in the City of Osage Beach; and each and all of the regulations, provisions, conditions and terms of such document on file in the office of the City Clerk are hereby referred to, adopted and made a part hereof as if fully set out in this Article.

City of Osage Beach

Code of Ordinances

Chapter 410, Article IV Design Standards, Article V Improvements, Article VI Storm Water and Drainage, Article VII Street Lighting

Chapter 410 / Article IV
Design Standards

Section 410.190 **Basic Standards.**
[R.O. 2006 §410.190; CC 1985 §22-61; Ord. No. 42.030 Art. IV §2, 5-10-1983; Ord. No. 00.19 §5, 6-1-2000]

~~The basic design standards shall be as provided by the Osage Beach Design Manual that shall be considered a part of this Section and is on file in the City offices.~~ The City of Osage Beach Design Guidelines Section 5 (adopted _____) and Section 6 (adopted _____) are hereby adopted as the basic standards for the City of Osage Beach for roads, road cuts, and the other requirements therein within the City. Each and all of said Design Guidelines are hereby adopted by reference and made a part of this Article as if fully set out herein. One (1) copy of the Osage Beach Design Guidelines is on file in the office of the City Clerk.

Section 410.200 **Relation To Adjoining Street System.**
[R.O. 2006 §410.200; CC 1985 §22-62; Ord. No. 42.030 Art. IV §1, 5-10-1983]

A. The arrangement of streets in new subdivisions shall make provisions for the continuation of the principle existing streets in adjoining areas (or their proper projection where adjoining land is not subdivided), insofar as they may be deemed necessary by the Commission for public requirements. Offset streets should be avoided. The angle of intersection between minor streets and major streets should not vary by more than ten degrees (10°) from a right angle. Streets obviously in alignment with existing streets shall bear the names of the existing streets.

B. All proposed street names should be checked against duplication of other street names. The widths and locations of major streets shall conform to the widths and locations designated on the comprehensive plan.

Section 410.210 **Character of Development.**
[R.O. 2006 §410.210; CC 1985 §22-63; Ord. No. 42.030 Art. IV §3, 5-10-1983]

A. The Commission shall confer with the subdivider regarding the type and character of development that will be permitted in the subdivision and may agree with the subdivider as to certain minimum restrictions to be placed upon the property.

B. Deed restrictions or covenants may be included to provide for the creation of a property owners' association or board of trustees for the proper protection and maintenance of the development in the future; provided however, that such deed restrictions or covenants shall not contain reversionary clauses wherein any lot shall return to the subdivider because of a violation thereon of the terms of the restrictions or covenants.

C. Where the subdivision contains sewers, sewage treatment plants, water supply systems, park areas, street trees or other physical facilities necessary or desirable for the welfare of the community, and

which are of common use or benefit and are not or cannot be satisfactorily maintained by an existing public agency, provision shall be made by trust agreement, made a part of the deed restrictions acceptable to any agency having jurisdiction over the location and improvement of such facilities, for the proper and continuous maintenance and supervision of such facilities.

Section 410.220 **Parks, School Sites, Etc.**
[R.O. 2006 §410.220; CC 1985 §22-64; Ord. No. 42.030 Art. IV §4, 5-10-1983]

Where an area being subdivided includes lands proposed to be used for parks or schools, under the duly adopted comprehensive plan of the City and environs, the subdivider shall not plat such lands as a part of the subdivision plat; and shall confer with the appropriate public agency regarding the time, method and amount of payment for the agency to acquire the land. If no agreement has been reached upon the acquisition of the area within five (5) years from the date of the submission of the preliminary plan, the subdivider may then plat the balance of the area.

Section 410.230 **Easements Along Streets.**
[R.O. 2006 §410.230; CC 1985 §22-65; Ord. No. 42.030 Art. IV §5, 5-10-1983]

Whenever any stream or important surface drainage course is located in an area, which is being subdivided, the subdivider shall provide an adequate easement along each side the stream for the purpose of widening, deepening, sloping, improving, or protecting the stream or drainage course.

Section 410.240 **Street Access.**
[R.O. 2006 §410.240; CC 1985 §22-66; Ord. No. 42.030 Art. V §6, 5-10-1983; Ord. No. 96.01 §1, 2-15-1996; Ord. No. 96.47 §1, 11-21-1996]

A. No subdivision shall be approved unless the area to be subdivided shall have frontage on and access from an existing street. All lots within a subdivision shall have at least one (1) boundary adjacent to a street or road approved by the City for public use, except that private easements or streets may be permitted when the lot is in agricultural or residential district and is three (3) acres or larger, no more than two (2) of which may be served by any single drive or easement, or the property and subdivision are part of a planned unit development (PUD) allowing private streets, or the street serves a legally established condominium development and a copy of the maintenance provisions are filed with the Planning Department. Private streets as described herein shall be constructed to meet the minimum base and surface requirements as described in this Code of Ordinances of the City of Osage Beach.

B. Double frontage and reversed frontage lots shall be avoided except where necessary to provide separation of residential development from arterial streets or to overcome specific topographic and/or orientation constraints.

C. *Access From Major And Secondary Arterial Streets.* Access from major and secondary arterial streets shall be limited. Lots shall not, in general, derive access exclusively from a major or secondary street. Where driveway access from major or secondary street may be necessary for several adjoining lots, the Planning Commission may require that such lots be served by a combined access drive in order to limit possible traffic hazards on said street. Where possible, driveways shall be designed and arranged so as to avoid requiring vehicles to back into traffic on major and secondary arterials.

Section 410.245 **Flag Lot Access.**
[R.O. 2006 §410.245; Ord. No. 92.24 §2, 10-22-1992]

A. Flag lots will be allowed for lots that contain a minimum of twenty thousand (20,000) square feet. Flag lots of lesser area may be approved by the Planning Commission.

B. The access portion of each flag lot shall have a minimum width of forty (40) feet.

C. Flag lots shall not be further subdivided into additional lots unless a public road is constructed to City standards.

D. No more than two (2) flag lots may have adjoining driveway entrances to a public right-of-way.

E. The front building line for flag lots shall be established on both the access portion and on the building site portion of the lot in accord with provisions of the particular zoning district.

F. A flag lot may be approved by the Planning Commission if the area is totally surrounded by land in other ownership or no other possibility exists.

G. The access portion of each flag lot shall provide access to only one (1) lot.

Section 410.250 **Access To Collector and Arterial Streets.**
[R.O. 2006 §410.250; Ord. No. 97.24 §2, 8-21-1997]

A. Subdivisions generally shall be designed to be internally accessed by local streets from arterial and collector streets. Residential lots shall not derive direct access or front on arterial streets. Residential lots fronting on collector streets shall be permitted where one (1) or more of the following provisions existed in the unsubdivided parcel:

1. The frontage along the collector is less than two hundred fifty (250) feet;

2. The depth of the tract is less than two hundred fifty (250) feet; and

3. The size of the tract is less than two (2) acres.

Section 410.260 **Location of Utilities in Rights-Of-Way.**
[R.O. 2006 §410.260; CC 1985 §22-67; Ord. No. 22.67 §1, 1-7-1992]

A. In order to provide for orderly development and to provide adequate room for location of present and future utilities, current utilities shall be located as follows:

1. Electric, telephone, water and cable shall be located within four (4) feet of the northernmost or western most right-of-way line.

2. Sewer lines shall be located within two (2) feet of the southernmost or easternmost right-of-way line.

B. Paved roadways shall be located as close to the center of the right-of-way as possible.

C. Waivers of this provision may be made in the case of very unusual geographical conditions by the

Planning Commission.

Article V
Improvements

Section 410.270 **Bond For Construction Required.**
[R.O. 2006 §410.270; CC 1985 §22-81; Ord. No. 42.030 Art. VI, 5-10-1983]

A. No final or official plat of any subdivision shall be approved unless:

1. The subdivider agrees with the Board of Aldermen upon an assessment whereby the City is put in an assured position to install the improvements listed below at the cost of the owners of property within the subdivision;

2. The improvements required by this Article have been installed prior to such approval;

3. The subdivider files with the Board of Aldermen a surety bond, cashier's check, or a certified check upon a solvent bank approved by the City conditioned to secure the construction of the improvements listed in a satisfactory manner and within a period specified by the Board of Aldermen, such period not to exceed two (2) years; or

4. The subdivider files with the Board of Aldermen an irrevocable, unconditional letter of credit in a bank approved by the City.

No such bond, check, or letter of credit shall be accepted unless it be enforceable by or payable to the City in a sum at least equal to one hundred twenty-five percent (125%) of the cost of constructing the improvements as estimated by the Building Inspector and in form with surety and conditions approved by the Board of Aldermen.

Section 410.280 **Plans.**
[R.O. 2006 §410.280; CC 1985 §22-82; Ord. No. 42.030 Art. VI, 5-10-1983; Ord. No. 13.57 §5, 9-19-2013]

Prior to the construction of any improvements required in a subdivision or to the submission of a one hundred twenty-five percent (125%) bond in lieu thereof, based on estimated cost of construction, or to the provision for any assessment for such construction, the subdivider shall furnish the Building Inspector all plans, information and data necessary to determine the character of the improvements. These plans shall be examined by the Public Works Director and will be approved, if they are in accordance with the requirements of this Article. Following this approval, construction may be started or the amount of a bond or irrevocable, unconditional letter of credit determined, or an assessment provided for.

Section 410.290 **Installation in Portion of Subdivision.**
[R.O. 2006 §410.290; CC 1985 §22-83; Ord. No. 42.030 Art. IV, 5-10-1983; Ord. No. 90.02 §1, 2-5-1990]

A. The owner of a tract may prepare and secure approval of a preliminary subdivision plan of an entire area and may install the improvements required by this Article only in a portion of such area, but the improvements shall be installed in any portion of the area for which a final plat is approved for

recording.

B. Trunk sewer lines, sewer collector lines, private sewage treatment plants and lagoons shall be designed and built in such a manner that they can easily be expanded or extended to serve the entire tract, subject to approval as set forth in Section **410.330**. Such sewer systems shall be designed and built in such a manner so as to connect to the City's public sewer system when development of the tract would result in any portion of the tract receiving final plat approval, including any dedicated right-of-ways, being located within three hundred (300) feet of the City's public sewer system.

Section 410.300 **Permanent Markers.**
[R.O. 2006 §410.300; CC 1985 §22-84; Ord. No. 42.030 Art. VI §1, 5-10-1983]

A. All subdivision boundary corners and the four (4) corners of all street intersections shall be marked with permanent monuments. A permanent monument shall be deemed to be concrete with a minimum dimension of four (4) inches extending below the frost line, or at least a three-eighth (3/8) inch iron rod imbedded in the ground. Should conditions prohibit the placing of monuments on the line, offset marking will be permitted; provided however, that exact offset courses and distances are shown on the subdivision plat.

B. A permanent benchmark shall be accessibly placed and accurately noted on the subdivision plat, the elevation of such benchmark to be based on the U.S.G.S. data.

Section 410.310 **Street Improvements.**
[R.O. 2006 §410.310; CC 1985 §22-85; Ord. No. 42.030 Art. VI §2, 5-10-1983; Ord. No. 13.57 §5, 9-19-2013]

All street and public ways shall be graded to their full width, including side slopes, and to the appropriate grade, and shall be surfaced with the appropriate width of surfacing in accordance with the standard specifications of the City. Such construction shall be subject to inspection and approval by the Public Works Director.

Section 410.320 **Water Lines.**
[R.O. 2006 §410.320; CC 1985 §22-86; Ord. No. 42.030 Art. VI §3, 5-10-1983]

Each lot within the subdivided area shall be provided with a connection to an approved water supply where reasonably accessible.

Section 410.330 **Sanitary Sewers.**
[R.O. 2006 §410.330; CC 1985 §22-87; Ord. No. 42.030 Art. IV §4, 5-10-1983; Ord. No. 90.02 §1, 2-5-1990]

A. The owner or subdivider of a tract shall provide for the disposal of sewage in the subdivision by a public collection system. Where any part of a tract:

1. To be subdivided, or

2. For which final plat approval is requested, lies within three hundred (300) feet of the public sewer

system of the City, the subdivider shall construct a sanitary sewer system which shall, upon demand by the City, connect to the public sewer system of the City. The subdivider shall provide a connection to each lot pursuant to Section **710.140** of the Code of Ordinances and shall provide the connection to City's public sewer system.

B. Plans and specifications for sewer systems shall be prepared for the subdivider by a registered professional engineer in accordance with the minimum requirements of the Department of Public Health and Welfare of the State of Missouri, the Department of Natural Resources of the State of Missouri and the City. Where allowed under the terms and provisions of this Chapter and of the Code of Ordinances of the City, private sewage disposal systems shall be installed in accordance with the regulations and minimum requirements of the aforesaid State authorities, applicable Federal law and the City. Such private sewer systems shall be designed so as to allow connection to the City's sewer system, upon demand made by the City, at some future date with an absolute minimum of construction and improvement required for such connection. Further, such systems shall be designed to operate economically, with minimum required maintenance and replacement of components both prior to, and after, connection to the City's sewer system.

C. In all cases the subdivider shall furnish the City a complete set of plans and profiles as approved by the appropriate authorities.

~~Section 410.340 **Storm Drainage Management and Sediment Control.**~~
~~**[R.O. 2006 §410.340; Ord. No. 05.04 §1, 3-3-2005; Ord. No. 07.42 §1, 10-24-2007]**~~

~~A. The City of Osage Beach hereby establishes a Storm Drainage Management Policy Plan which will assure that, through public instruction, awareness, and the application of Storm Water Best Management Practices, pollution of the Lake of the Ozarks and tributary watersheds within the jurisdictional limits of the City will be limited to the minimum practicable attainable level and that neighboring properties will be protected from damage.~~

~~B. All developers/owners/or others developing, redeveloping or renovating a building site, parking area, recreation site or subdivision covering more than two (2) lots or encompassing more than one-half (½) acre, whichever shall be the smaller, shall conform to the storm drainage management policy of the City of Osage Beach as set forth in these ordinances and as stated or depicted in the City of Osage Beach Design Guideline.~~

~~1. All construction projects shall require a Sediment Control Plan to be submitted and approved prior to the commencement of clearing or construction on the project site as a part of the building permit process.~~

~~2. A Storm Drainage Plan shall be submitted and approved as a part of the planning process and shall be approved prior to the approval of the final plat or the issuance of a building permit.~~

~~Section 410.350 **Sediment Control Plan.**~~
~~**[R.O. 2006 §410.350; Ord. No. 05.04 §1, 3-3-2005; Ord. No. 07.42 §2, 10-24-2007]**~~

~~A. A Sediment Control Plan is required for all new construction sites within the jurisdictional boundaries of the City of Osage Beach in which the construction, or clearing for construction, or modifying the~~

drainage characteristics of the area disturbs an area exceeding two (2) lots or one-half (½) acre, whichever shall be the smaller.

B. The developer/owner shall submit a Sediment Control Plan prepared by a registered professional engineer stating the goals of the plan and depicting the locations and details of construction of all sediment control devices to be employed in the plan. The plan shall clearly set out the contractor's maintenance schedule and requirements for maintaining the integrity of the plan.

C. The devices and measures utilized shall follow the recommended "Best Management Practices" (BMP) as described in the publication "Protecting Water Quality" (by and available through MDNR), the City of Osage Beach Design Guidelines, and as directed herein. The specific intent of the sediment control plan shall be: 1) reduce the quantity of runoff, 2) control runoff so as to prevent the pickup of silt, sediments, and debris, 3) assure that no visible sediment leaves the jobsite, and 4) no damage is caused to downstream properties by runoff from the project.

As a minimum, the following shall be required:

1. Stabilized earthen berms, straw bale check dams, silt fences, and other BMPs shall be utilized as necessary to prevent runoff from carrying silt, debris, and other debris off the jobsite.

2. On side hill lots or parcels with slopes in excess of ten percent (10%) runoff control devices paralleling the contours shall be erected at not more than one hundred twenty-five (125) foot intervals.

3. All drainage channels or ditches, where flow velocities will exceed five (5) feet per second shall be lined with an approved engineering fabric or erosion control matting.

4. All denuded slopes or embankments shall be protected from erosion by the installation of earthen berms, straw bale dikes or other appropriate BMP.

5. Temporary catch basins, drop inlets and storm drains (culverts) shall be utilized as necessary.

6. All denuded slopes shall be reseeded, fertilized and mulched within four (4) weeks of the initial clearing or stripping of vegetation. Slopes steeper that two (2) to one (1) shall be stabilized with jute mesh or other approved erosion control mat.

7. The written Sediment Control Plan shall clearly state that it is the intent of the submitted plan that no visible sediment will be allowed to leave the development site.

D. The Sediment Control Plan shall be submitted as a part of the building permit process and shall be reviewed and approved by the Public Works Director prior to the start of any on-site work including selective clearing, clearing and grubbing, site excavation or embankment construction. **[Ord. No. 13.57 §5, 9-19-2013]**

E. In the event that the plan is deficient or inadequate to prevent sediment escaping the job site or damage to downstream properties occurring, the owner/developer shall immediately take any and all measures necessary to stop and prevent further contamination or damage and to repair the contaminated or damaged areas.

F. *Certification By The Engineer Of Record.* The Engineer of Record shall certify in writing as a part of the Sediment Control Plan that it will be implemented prior to the beginning of any land disturbance on the site and that all appropriate and necessary BMPs will be established and maintained to assure compliance with the goals of the plan. In the event that the established BMPs are damaged or are found to be inadequate by the Engineer, the owner shall immediately implement corrective action or maintenance to assure the integrity of the system.

Section 410.360 **Storm Drainage Plan.**
[R.O. 2006 §410.360; Ord. No. 05.04 §1, 3-3-2005; Ord. No. 07.42 §3, 10-24-2007]

A. A Storm Drainage Plan is required for all new construction sites within the jurisdictional boundaries of the City of Osage Beach in which the construction, or clearing for construction, disturbs an area exceeding two (2) lots or one-half (½) acre, whichever shall be the smaller. Further, a Storm Drainage Plan is required for all site improvement projects that will effectively change the drainage characteristics for a site of one (1) acre or more such as paving previous gravel or soil surfaces, etc.

B. The developer/owner shall submit a Storm Drainage Plan prepared by a registered professional engineer, stating the goals of the plan and depicting the locations and details of construction of all sediment and drainage control devices, and BMPs, required to control storm runoff from a 20-year storm or one that produces two and one-half (2½) inches per hour for not less than one (1) hour. The plan shall clearly set out the contractor's maintenance schedule and requirements for maintaining the integrity of the plan.

C. The devices and measures utilized shall follow the recommended "Best Management Practices" as described in the publication "Protecting Water Quality" (by and available through MDNR), the City of Osage Beach Design Guideline, and as directed herein. The goals of the Storm Drainage Plan shall be: 1) to reduce the quantity of storm runoff, 2) to control runoff velocities in order to prevent the pickup and carrying of silt, sediments, and debris, 3) to assure that no visible silt, sediment, or debris leaves the project site, 4) to assure the protection of downstream properties from damage due to runoff from the project, 5) to assure that the minimum practicable amount of sediment and/or pollution is allowed into the Lake of the Ozarks.

D. These goals shall be accomplished through a combination of methodologies as set forth in the MDNR Field Manual for Protecting Water Quality and the City of Osage Beach Design Guidelines.

Section 410.370 **Storm Drainage Plan — Minimum Technical Requirements.**
[R.O. 2006 §410.370; Ord. No. 05.04 §1, 3-3-2005; Ord. No. 07.42 §4, 10-24-2007]

A. As a minimum, the Storm Drainage Plan shall provide:

1. *Required technical data.*

a. Provide an engineering drawing clearly depicting the watersheds and drainage areas effecting the project and adjacent properties.

b. Provide engineering computations clearly establishing the theoretical runoff from the original or existing area and the theoretical runoff from the completed project area for a 20-year storm or one that produces a minimum of two and one-half (2½) inches per hour for one (1) hour duration.

c. Devise and provide BMPs in the form of retention, storage, percolation, or other approved method to assure that only flows of less than or equal to the original undisturbed condition are allowed to flow off the site. Excess shall be retained for discharge at later period.

(1) Project sites discharging via right-of-way, easement, or land owned by developer to the Lake of the Ozarks shall be exempt from this requirement.

d. Establishes the percolation rates for all infiltration, percolation and filtration devises.

e. Determines the anticipated flows and capacities of all channels, culverts and conveyance devices.

f. Clearly identifies areas to receive plantings of grass or scrubs as a part of applied BMP.

g. Clearly identifies and provides flow data for all velocity control and/or energy dissipation devices.

h. Provide documented assurance that all planned BMPs will be maintained by the prospective owners by covenant or other approved legal device.

2. *Minimum required facilities.*

a. Provide removal or containment of all silt, sediment and debris carried onto or across the development so as to assure that no silt, sediment or debris is allowed off the developed area.

b. Assure that all storm runoff is controlled such that no damage will occur to adjacent downstream properties or facilities. Provide approved devices so as to insure that no more than the original runoff rate over time will exit the property at any one given time and shall be in place prior to any occupancy permit being issued.

c. Where parking areas for more than twenty (20) cars exist, provide for removal of oils, grease, and volatile wastes to the maximum practicable by the use of BMP.

d. Provide velocity control devices at all discharge points to assure discharge velocities of less than five (5) fps.

(1) These requirements may be accomplished by the use of approved BMPs, infiltration, percolation, filtration devices, retainage and sedimentation collection, filtered drop inlets or manholes, or other devices as approved by the Public Works Director. **[Ord. No. 13.57 §5, 9-19-2013]**

(2) At the completion of the project, the Engineer of Record shall certify in writing to the City that all necessary BMPs are in place, maintained, and functioning so as to assure compliance with the goals of the Storm Drainage Plan.

Section 410.380 **Maintenance of Storm Drainage Facilities.**
[R.O. 2006 §410.380; Ord. No. 05.04 §1, 3-3-2005; Ord. No. 07.42 §5, 10-24-2007]

Storm drainage facilities, including infiltration areas, filtration devices, conveyance devices and other BMP utilized, shall be maintained by the property owner. All such devices shall be kept free of silt, debris, sediment and other deposits and shall be maintained in a fully operable and functional condition.

Article VI
Storm Water and Drainage

Section 410.350 **Scope.**

The provisions of this Article shall obligate any owner, occupant, lessee, mortgagee, agent, person applying for or holding a Site Development Permit, or other person having an interest in or control over the land, site, building, or structure affected. If any of the foregoing is a corporation, company, trust, partnership, or other entity, this Article shall further apply to (1) any owner, partner, or member of such entity, and (2) any officer, director, manager, trustee, receiver, agent, foreman, supervisor, or designee of such entity if such person has any control over the covered action regarding the land, site, building, or structure affected. Each of the foregoing shall be collectively referred to as "**Responsible Parties**."

Section 410.355 **Design Guidelines, compliance, permit.**

A. The City of Osage Beach Design Guidelines Section 4 (adopted _____) are hereby adopted as the basic standards for the City of Osage Beach for stormwater, erosion, surface drainage, and the other requirements therein within the City. Each and all of said Design Guidelines are hereby adopted by reference and made a part of this Article as if fully set out herein. One (1) copy of the Osage Beach Design Guidelines is on file in the office of the City Clerk.

B. All permit holders shall comply with the aforementioned Design Guidelines. All permit holders shall timely file, implement, and update any Plan required by said Design Guidelines, including but not limited to Erosion and Sediment Control Plans and Storm Drainage Plans. All permit holders shall timely implement, maintain, control, and repair any measures required by said Design Guidelines or any Plans required thereby. All Responsible Parties are obligated to ensure that any permit holder acting on their behalf complies with this Article.

C. No clearing, grading, borrowing or filling of land requiring a Site Development Permit shall be performed without first obtaining such permit. No Site Development Permit shall issue until the fees required by **Section 510.120** have been paid, the submissions required by **Article II of Chapter 510** have been received and approved, and all other pre-construction plans and submissions have been received and approved by the City as required.

Section 410.360 **Limitations on liability.**

Floods from stormwater runoff may occur which exceed the capacity of stormwater drainage facilities constructed and maintained under this Article. This Article does not guarantee that property will always be free from stormwater flooding or flood damage. This Article shall not create a liability on the part of, or cause of action against, the City or any officer or employee thereof for any flood damage. Neither does this Article purport to reduce the need or the necessity for obtaining flood or other insurance.

Section 410.365 **Rights of way to be kept clear.**

Regardless of the amount of land disturbance at a particular site, it shall be the responsibility of all Responsible Parties to ensure streets, sidewalks, rights of way, and water courses (including Lake of the Ozarks) open to the public surrounding a permitted site are kept free of excessive debris and sediment. Upon notification from the City to any permit holder and/or Responsible Party that a problem exists, the permit

holder and/or Responsible Party shall immediately remedy the issue. If the issue is not promptly remedied, the City may temporarily suspend any permit until the problem has been resolved. If a Responsible Party does not address the issue after requested, the City may choose to remedy the situation and bill the permit holder and/or Responsible Parties for any reasonable associated costs. The permit will remain suspended until said bill is paid. Alternatively, the permit holder and/or Responsible Party owner may request a hearing with the City Administrator to contest the abatement costs.

Section 410.370 **Interpretations, conflict, severability.**

A. Interpretation. The provisions of this Article shall be the minimum requirements for the protection of the public health, safety and general welfare.
B. Conflict. Conflict with public and private provisions:
    1. Public provisions. Where any provision of this chapter imposes restrictions different from those imposed by any other law or regulation, whichever is more restrictive or imposes a higher standard shall control.
    2. Private provisions. This chapter is not intended to abrogate any easement, covenant or any other private agreement or restriction; provided, that where the provisions of this chapter are more restrictive or impose higher standards or regulations that such easement, covenant, or other private agreement or restriction, the requirements of this chapter shall remain applicable.
C. Severability. The provisions and sections of this article shall be deemed to be severable, and the invalidity of any portion of this article shall not affect the validity of the remainder.

Section 410.380 **Violations and penalties.**

A. It shall be a violation of this Article to knowingly disobey a command, requirement, or instruction from the Building Official, City Engineer, any of their designees, or any other City employee or agent authorized to make such command, requirement, or instruction.
B. The City may suspend or revoke any permit associated with the site or any permit associated with the Responsible Parties holding the permit(s) for the site for non-compliance with this Article.
C. Procedure.
    1. Upon discovery of a violation of this Article, the Building Official shall issue a Notice of Violation to any or all responsible parties (owner, developer, contractor, site supervisor, or any other person working on or having control over the site) giving a reasonable time, not to exceed seven days, to remedy the violation. In emergency situations that cause a risk to life, health, property, or public welfare, or where the violation is willful or wanton, the Notice of Violation may dispense with the time to remedy by listing the condition(s) which constitute the emergency or willful/wanton violation.
    2. If the violation has not been remedied within the time frame set forth in the notice, the Building Official may issue a written Stop Work Order suspending the permit(s). Once the violation has been remedied, the suspension will be lifted.
    3. If the violation for which the permit(s) was suspended is not corrected within 30 days, the permit(s) shall be revoked and the violation deemed a nuisance under **Section 215.020**. The Notice of Violation above shall satisfy the notice to abate requirement of **Section 215.030**.
    4. After two suspensions of a permit for the same site, or one emergency suspension of a permit, the Building Official may revoke the permit(s). A permit shall not be re-issued until all applicable procedures in this Code have been followed. Additionally, any remediation or abatement costs may be required to be paid prior to re-issuance.
D. Any person violating any of the provisions of this Article or any requirement adopted in this Article

shall be deemed guilty of an ordinance violation and upon conviction thereof shall be fined in an amount not exceeding five hundred dollars ($500.00) or be imprisoned in the County Jail for a period not exceeding ninety (90) days, or both such fine and imprisonment. In addition thereto, the violator(s) shall pay all costs and expenses incurred by the City in such case. Each day such violation is committed or permitted to continue shall constitute a separate offense and shall be punishable as such hereunder.

Article VII
Street Lighting

Section 410.390 **Street Lighting Location Standards.**
[R.O. 2006 §410.400; Ord. No. 98.04 §2, 3-19-1998]

A. Street lighting shall be provided at each street intersection to adequately illuminate the entire surface of the intersection.

B. Where intersections on existing or proposed residential or local streets are in excess of four hundred (400) feet apart, additional lights shall be placed along the street at intervals not exceeding four hundred (400) feet. Existing lots with road frontage of three hundred (300) feet or less shall be exempt.

C. Where intersections on existing or proposed non-residential or collector streets are in excess of three hundred (300) feet apart, additional lights shall be placed along the street at intervals not exceeding three hundred (300) feet. Existing lots with road frontage of two hundred (200) feet or less shall be exempt.

D. Where intersections on existing or proposed arterial streets are in excess of two hundred (200) feet, a street light shall be provided at intervals not exceeding two hundred (200) feet. Existing lots with road frontage of two hundred (200) feet or less shall be exempt. Lighting along State arterial corridors shall be installed in accordance with Missouri Department of Transportation standards or as specified by an adopted street lighting plan.

E. Street lights that extend over the paved surface shall be a minimum of twenty (20) feet above said surface. Lights that do not extend above the pavement surface shall be a minimum of twelve (12) feet in height.

F. Street lights shall be provided at all cul-de-sacs, public turnaround areas, or abrupt turns, and at the terminal end of dead-end streets.

G. Street light structures and poles shall be placed in the right-of-way of the proposed or existing street(s). Street lights shall be placed as close to the right-of-way line as possible. Light poles or structures which impede drainage or may create a traffic hazard, as determined by the Public Works Director, shall be redesigned or relocated in conformance with the provisions herein. **[Ord. No. 13.57 §5, 9-19-2013]**

Section 410.400 **Street Lighting Design Standards.**
[R.O. 2006 §410.410; Ord. No. 98.04 §3, 3-19-1998; Ord. No. 00.19 §8, 6-1-2000]

Street lights to be located within or adjacent to City street or parking right-of-way or easements shall be designed in accordance with the Osage Beach Design Guidelines, which shall be on file in the City offices.

City of Osage Beach

Code of Ordinances

Design Guidelines Section 4 – Storm Drainage

Design Guidelines
City of Osage Beach
SECTION 4 - STORM DRAINAGE

(Revised ~~21 OCT 04 – SH~~ AUGUST _____, 2023)

OVERVIEW

Storm runoff accumulates pollutants, sediment, and debris as it flows over the landscape until it reaches a receiving waterway - the Lake of the Ozarks. These pollutants, sediments, and debris include oils and petroleum residues, animal refuse, garbage, organic debris from vegetation, silts, sands, and other objectionable materials. The U.S. Environmental Protection Agency (EPA) and the Missouri Department of Natural Resources, Water Pollution Control Division, considers these pollutants to have adverse effects upon the human and aquatic life that uses the lake for habitat or recreational needs. The water quality of the Lake of the Ozarks is vital to the health and economic well being of our residents, visitors, and community.

Storm drainage within the City of Osage Beach falls under regulatory authority of the U.S. Environmental Protection Agency (EPA) and the Missouri Department of Natural Resources (MDNR). The provisions of the U.S. Clean Water Act of 1978, Section 402 mandates the National Pollutant Discharge Elimination System (NPDES) and requires permitting for specific types of non-point pollutant sources under Phase II (Final Rule dated December, 1999) for areas where more than one acre of natural ground cover is disturbed. In addition, it mandates other control measures for designated cities, industries, and locations. The City of Osage Beach is not currently designated as a small city with a separate storm water system (MS4) or required to have a NPDES Permit. Several of the Phase II requirements do apply to the C~~e~~ity. It is the policy of the City to reduce the contamination of the Lake of the Ozarks to comply with NPDES Phase II to the extent practicable for the city

The City of Osage Beach complies with these requirements through City Code, Title IV Land Use, Section 410.340, 410.350, 410.360, and 410.370 and the applicable portions of the Osage Beach Design Guidelines.

GOALS AND OBJECTIVES

The goal and objective of the City of Osage Beach's Storm Water Management Plan is to manage storm water drainage within the city limits so as to minimize the pollution of the Lake of the Ozarks and to prevent storm water run-off damage to the maximum extent practicable.

The primary source of visible pollutants during storm runoff is through sediment and debris picked up on construction sites or locations where the natural vegetation has been removed. The major secondary source is through volatile fuels, oils, animal wastes, and

refuse picked up by storm runoff as it flows off large parking areas, roofs and over the terrain in route to the lake. These sources of contamination will be addressed separately through the application of a Sediment Control Plan and/or a Storm Drainage Plan.

Recent developments in the Storm Drainage Compliance area have lead to the development of "Best Management Practices" (BMP's) and less emphasis on retention facilities. Also the trend is toward reduction of contamination by: 1) reducing the quantity of storm water runoff, 2) reducing or removing the contamination of the runoff, and 3) by conveying the storm run-off without further contamination.

Our goal is to reduce the pollution of the lake through public education, awareness, and the application of MoDNR Best Management Practices (BMP's). Our immediate objective is to manage the storm drainage system to reduce~~such that no~~ collectable sediment or pollutants entering~~reach~~ the lake and/or causing~~es~~ damage to adjacent or downstream properties.

The following design guidelines will establish the minimum steps or procedures required to reach these goals and objectives.

EROSION & SEDIMENT CONTROL PLAN

A. The Erosion and Sediment Control Plan shall be submitted as a part of the building permit process and shall be reviewed and approved by the City Engineer prior to the start of any onsite work for any and all projects involving two or more lots or ½ acre, whichever shall be the smaller.
Note: The MoDNR requires a Land Disturbance ~~Sediment Control~~ Permit for construction disturbance activities of one or more acres.~~ all construction projects of one acre or more in area~~. Permitting with MoDNR is the responsibility of the property owner or their representative.

1. The Sediment Control Plan must be prepared by a Registered Professional Engineer in the State of Missouri stating the goals of the plan and depicting the locations and details of the construction of all sediment control devices to be utilized on the project during construction.
2. The plan shall clearly set out the contractor's schedule and requirements for maintaining the integrity of the plan.
3. The primary goal of the plan is to assure that no visible or measurable sediment or debris is allowed to leave the developed area.
4. The devices and measures utilized shall follow the recommended "Best Management Practices" as described in the publication "Protecting Water Quality" by MDNR and as directed herein. At the minimum the following shall be required:

a. Wire backed silt fencing with steel tee-posts shall be installed around the downhill edges of the disturbed area.
b. Earth berms and swales shall be used to reduce sheet flow volumes and velocities.
c. Straw bale check dams, earth berms and other BMP's shall be utilized as necessary to prevent run-off from carrying sediment and debris off site.
d. Check dams or other BMP's shall be used to reduce~~assure~~ velocities in areas of concentrated flow~~do not exceed 5 fps~~.
e. Approved engineering fabric or erosion control matting shall be used in all drainage courses or ditches where flow velocities exceed 5 fps. Velocities shall be calculated and included with permit submittal.
f. All denuded slopes or embankments shall be protected from erosion by the installation of earthen berms, straw bale dikes, or other appropriate BMP's.
g. Temporary catch basins, drop inlets and/or storm drains (culverts) shall be utilized as necessary to convey concentrated flow and prevent erosion.
h. Temporary sediment basins shall be provided for each drainage area with one or more acres disturbed at one time. Basins shall be maintained until final stabilization is achieved as approved by the City Engineer. Each sediment basin shall be sized, at a minimum, to treat a local 2-year, 24 hour storm. The sediment basin shall include an outlet structure designed for the slow release of stored runoff to allow for sedimentation in the basin. A perforated riser wrapped in filter fabric and covered with a mound of clean 2-inch stone is the City's preferred outlet structure.
i. Depict existing and proposed contours.
j. Clearly depict the entire drainage area effecting the development site including downstream areas that will be effected by storm water run-off or drainage and upstream areas that contribute to the site.
k. The installation of all BMP's shall be inspected and approved by the City Engineer and the Engineer of Record prior to commencing land disturbance activities. The Engineer of Record shall provide a letter to the City stating he or she approves the installation of the BMP's. Phased projects may require multiple approvals.
l. Where soil disturbing activities on site have ceased either temporarily or permanently and will not resume for a period of 14 calendar days, stabilization shall be initiated immediately and completed within 14 calendar days. All denuded slopes or areas shall be reseeded with appropriate seed, fertilize~~d~~r, and mulch~~ed within four weeks of the time the original ground cover was~~

~~removed~~. ~~Jute mesh, "Petro-mat" or other~~ For final stabilization, approved slope stabilization fabric or stone armoring shall be installed on all slopes steeper than 3:1.

m. Phased clearing and grading of sites is encouraged to minimize denuded areas and potential for erosion.

5. In the event that the plan is deficient or inadequate to prevent sediment escaping the jobsite, the Owner/Developer shall immediately take any and all measures necessary to stop and prevent further contamination, and to clean up contaminated areas.

All calculation necessary for the Erosion and Sediment Control Plan shall be signed and sealed by an Engineer licensed in the State of Missouri and submitted with the permit application for review by the City Engineer. Calculations shall be prepared in a report format.

The City's Standard Erosion and Sediment Control Plan Note Block shall be included on the Plans prior to approval.

STORM DRAINAGE PLAN

A. A Storm Drainage Plan is required for all new construction sites within the jurisdictional boundaries of the City of Osage Beach in which the construction or clearing for construction disturbs an area exceeding two lots or one half acre, whichever shall be the smaller.

1. The Storm Drainage Plan shall be prepared by a Registered Professional Engineer in the state of Missouri stating the goals of the plan and depicting the locations and details of construction of all permanent sediment and drainage control devices, and post construction BMP's, to be utilized in the plan. The Storm Drainage Plan shall depict permanent drainage structures and post-construction BMP's.
2. The plan shall clearly state owners schedule and requirements for maintaining the components of the system.
3. The devices and measures utilized shall follow the recommended "Best Management Practices" as described in the publication "Protecting Water Quality" by and available through MDNR, the City of Osage Beach City Code and the City of Osage Beach Design Guidelines
4. At the minimum the Storm Drainage Plan shall provide the following technical data:

a. Clearly depict all permanent drainage structures, conveyance devices, and post construction BMP's.

b~~a~~. Clearly depict the entire drainage area effecting the development site including downstream areas that will be effected by storm water run-off or drainage and upstream areas that contribute to the site.

c~~b~~. Accurately calculate the anticipated storm run-off from a theoretical twenty-five (25~~20~~) year storm event. Storm duration shall be calculated to correspond to the time of concentration for the tributary drainage area.

~~c. Establish the percolation rates for all infiltration, percolation, and filtration devises.~~

d~~c~~. Determine the anticipated flows and capacities of all channels, culverts and conveyance devices. Conveyance structures shall be designed utilizing the criteria in A.4.b of this Section.

e~~d~~. Clearly identify and provide flow data for all velocity control and/or energy dissipation devices.

5. At the minimum the Storm Drainage Plan shall provide the following post construction sediment and drainage controls:

a. Provide removal or containment of all silt, sediment, and debris carried onto or across the development so as to assure that no silt, sediment, or debris is allowed off the developed area. See Post Construction Water Quality.

b. Assure that all storm run-off is controlled such that no damage will occur to adjacent downstream properties or facilities. Failure to demonstrate no damage will occur to downstream properties shall trigger stormwater detention requirements.

c. Where parking areas for more than twenty cars exist provide for removal of oils, grease and volatile wastes to the maximum practicable extent by the use of post construction BMP's.

d. Assure that conveyance discharges into the Lake of the Ozarks will have a velocity of less than 5 fps.

This can be accomplished by the use of BMP's, ~~infiltration, percolation~~, filtration devices, retainage and sedimentation collection basins, filtered curb inlets/manholes or other devices as approved by the City Engineer.

STORM DRAINAGE COMPUTATIONS

A. The Rational Method shall be ~~methodology~~ used ~~by the City of Osage Beach~~ for computation of stormwater run-off. ~~shall be similar to that discussed in Chapter IX of the Missouri Department of Transportation (MoDOT) Project Development Manual and as modified herein.~~

1. The base storm event for computation of run-off ~~volumes~~ shall be a twenty five-year (25~~20~~) storm event.
2. The Rational Method of computation shall be used as herein ~~modified~~.

$$Q=CIA$$

Where:

Q = Peak runoff in cubic feet per second (cfs)

I = ~~2.5 inches per hour shall be used as the~~ Rainfall Intensity.[1]

A = Area of watershed in acres. This area includes the actual area drained through or in addition to the developed area.

C = Coefficient (weighted by area)[2] ~~An adjustment coefficient used to account for soil and terrain absorption as established herin. established herein~~.[2]

[1] Storm duration shall be calculated to correspond to the time of concentration for the tributary drainage area. ~~Normally the Time of Concentration (t_s) would be computed and the value for "I" taken from the appropriate table dependant upon the MoDOT District involved. Due to the short travel distances for run-off on most of our projects that procedure would give an unrealistically high value. We have selected the 2.5 inches per hour as a valid value for our use.~~

[2]Values of C categorized by surface:

Surface Type	Value of C
Impervious (asphalt pavement, concrete pavement, stone/rock surfaces, rooftops, etc.)	0.95
Pervious (greenspace, lawns, unimproved areas)	0.35

If more than one surface type is included in the drainage area, the designer shall calculate the weighted coefficient for use in runoff calculations.

All stormwater calculation shall be signed and sealed by an Engineer licensed in the state of Missouri and submitted with the permit application for review by the City Engineer. Calculations shall be prepared in a report format.

~~Type or Location of Project~~	~~Value of C~~
~~Single family residential lots~~	~~0.4~~

~~Multi-unit Residential (less than 20 units) 0.5~~

~~Condominium Developments where parking areas and building foot print occupy less than 50% of the development site 0.6~~

~~Commercial or condominium sites where parking areas and building or developed space covers more than 50% of the developed area 0.7~~

DESIGN OF DRAINAGE STRUCTURES AND DEVICES

A. Culverts and Storm Drainage Piping Systems shall be designed using the Manning equation for open channel flow. Inlet conditions should be investigated and openings designed to handle the peak runoff condition. In addition the following conditions shall be met:

1. The minimum pipe size shall be 18-inch diameter.
2. Bedding shall be installed around the pipe from 4 inches below to 12 inches above the pipe. Bedding shall be nominal ½ inch minus crushed rock conforming to MoDOT Type 5 aggregate.~~MDOT Section 1004, Grade D, Chat, or pea gravel, or Osage River Sand. Any material used shall have a PI of six or less.~~
3. The minimum grade shall guarantee a minimum velocity of 2.0 fps.
4. Manholes or inlets shall be constructed at not more than 350-foot intervals and at all bends and changes of grade.
5. ~~Pipe may be run on the curve so long as the manufacture's maximum deflection at each joint is not exceeded.~~ All ~~other~~ pipe shall be run true to line and grade between manholes or inlets.
6. Outlets shall have intrusion gates to prevent entry by children or animals.
7. Outlets shall end in an energy-dissipating device that will reduce the outlet flow velocity to less than 5 fps.
8. Piping shall be designed to sustain any anticipated loading conditions

B. Curb Inlets of the "Kansas City Type" are preferred. See Drawing No. IV-11

1. The length of Curb Inlet opening shall be determined as in Chapter IX of the MoDOT Project Development Manual.
2. Floor of Inlet shall be shaped with invert to provide smooth flow.
3. Locate manhole ring and cover over outlet.
4. Each Inlet shall have cast iron steps spaced at 1'-4" centers vertically.
5. Bevel all exposed edges with ¾" chamfer or ½" tooled edge.
6. On grade Inlets shall conform to the street grade and sump Inlets shall be level.

7. The length plus the width shall not exceed 15' without special design.
8. Each Inlet shall be placed on a 4" compacted aggregate base.
9. Each Inlet shall have a steel inlet frame.
10. Each Inlet shall be designed to sustain any anticipated loading conditions. In no case shall materials and design not be sufficient to support an ASHTO HS-20~~H-44-20~~ loading.
11. Transition curb in 10' on upstream side of inlet and in 5' on the downstream side. 10' transition on both sides for sump inlet. See detail.

C. Open Channel Design ~~Velocity Control – reduce pick up of sediment and debris (Land Form and Site Grading)~~

~~1. Grass Drainage Swales control direction and velocity of sheet or small rivulets flows by keeping flow velocities under 5 fps. See Drawing No. IV-6.~~

~~2. Riprap Drainage Swales control larger volumes of sheet flow and rivulets by keeping flow velocities under two fps. See Drawing No. IV-7.~~

1~~3~~. Open Channel Drainage ~~Channels~~ shall be designed using the M~~m~~annings E~~e~~quation for open channel flow. The channel shape maybe trapezoidal, rectangular or circular at the designer's discretion.

a. The channel depth shall be designed so that the peak runoff flow will be accommodated at 2/3rd of the channel depth.
b. Where channel depth will exceed one foot, a trapezoidal section with a maximum of 1:1 side slopes shall be used.
c. Where flow velocity will exceed 2 fps engineering fabric or erosion mat shall be utilized. Selected fabric or mat shall be rated for the intended application. Velocities shall be calculated and included with permit submittal.
d. Where velocity will exceed 5 fps riprap shall be installed to eliminate scouring. See Drawing No. IV-7. Velocities shall be calculated and included with permit submittal.

All stormwater calculation shall be signed and sealed by an Engineer licensed in the State of Missouri and submitted with the permit application for review by the City Engineer. Calculations shall be prepared in a report format.

~~OVERLAND FLOW OR SHEET FLOW CONTROL~~

~~A. Reduce available sediment and debris (Land Form Controls)~~

~~1. Insure that no areas are left denuded. Prepare seed bed, fertilize, mulch, and install erosion mat or fabric within 30 days of clearing operations.~~

2. Provide vegetation belts of shrubbery, small trees, etc. to retard sheet flow.
3. Provide erosion mat or fabric at all areas where erosion is apparent.

B. Reduce quantity of overland or sheet flow by utilizing the following methods:

1. Flow control swales to reduce down hill sheet flow velocities and promote short-term ponding and infiltration. See Drawing No. IV-3 & 9.
2. Vegetation belts. Plant a band of shrubbery, flowers, and etc. transverse to the slope to reduce sheet flows. See Drawing No. IV-4 & 10.
3. Infiltration trenches to infiltrate a portion of the sheet flow into the ground water. Infiltration rates should be tested for and volumes computed as a part of the overall Storm Water Management Plan. Design infiltration rate will generally be less than 1.0 gal/sf/hr and will tend to decrease over time. See Drawing No. IV-5.

C. Velocity Control – reduce pick up of sediment and debris (Land Form and Site Grading)

1. Grass Drainage Swales control direction and velocity of sheet or small rivulets flows by keeping flow velocities under 5 fps. See Drawing No. IV-6.
2. Riprap Drainage Swales control larger volumes of sheet flow and rivulets by keeping flow velocities under two fps. See Drawing No. IV-7.
3. Open Channel Drainage Channels shall be designed using the manning equation for open channel flow. The channel shape maybe trapezoidal, rectangular or circular at the designer's discretion.

a. The channel depth shall be designed so that the peak runoff flow will be accommodated at 2/3rd of the channel depth.
b. Where channel depth will exceed one foot, a trapezoidal section with a maximum of 1:1 side slopes shall be used.
c. Where flow velocity will exceed 2 fps engineering fabric or erosion mat shall be utilized.
d. Where velocity will exceed 5 fps riprap shall be installed to eliminate scouring. See Drawing No. IV-7.

POST CONSTRUCTION WATER QUALITY

C. Silt, Sediment, and Debris Control – Filtering Systems

1. In order to avoid the use of sedimentation basins or retention ponds It shall be required that appropriate filtration methods are used in order to assure that silt, sediment, and debris do not get into the conveyed storm drainage flow. The above measures will control sediment for sheet or cross-country flows.

~~However, construction~~ Parking areas, roof tops and other similar ~~manmade~~ surfaces (not including single or two family residential), will require the collection and isolation of silts, sediments, debris, oils, and volatile materials. Also see Strom Drainage Plan A.5.c. ~~One method of accomplishing this is by construction filtering systems. There are several commercial products available to accomplish this goal. Grasspave, Gravelpave, and Grasscrete are patented soil stabilization products that are designed to serve as a paving or traffic-bearing surface.~~ New developments that disturb less than 1 acre and are not part of a larger common plan of development that will disturb 1 or more acres over the life of the project are not required to meet the post construction water quality requirement. Water quality requirements shall not apply to City streets or new constructed streets to be dedicated to the City.

Approved filtering systems are as follows:

~~a. Constructed Filter Strip. In large parking areas, or relatively flat open areas, a cut-off curb can be constructed with a filtration strip of variable width constructed in front of it. Such strip would have a traffic bearing infiltratable surface such as Gravelpave underlain by a clean open graded gravel medium around a perforated collection pipe laid to grade to drain to a central or periphery drainage system. The medium would be enclosed in an engineering fabric envelope. Design infiltration rates would vary with materials and should be designed in accordance with the manufacture of the traffic bearing media recommendation. Flow in the neighborhood of 0.25 gpm can be anticipated. It will be necessary to remove the accumulated sediment and debris and very top portion of the gravel or replace the grass layer as appropriate in order to maintain adequate infiltration. The required maintenance interval will depend upon the rate of collection of sediment. See Drawing No. IV-8.~~

~~b. Porous Pavement. The use of porous pavements for large parking areas is a viable alternative method of providing filtered run-off from the parking areas. Cross country run-off should be diverted from the paved area and treated separately in order to avoid rapid plugging and increased maintenance costs. In the general application in Osage Beach the preferred methodology would be to drain the porous pavement to a clean aggregate percolation bed that drained to collection piping manifolded into the overall storm drainage system and discharged to the Lake or other approved surface system. In isolated cases it may be preferable to discharge to the ground water table with a surface overflow for over design~~

~~storm peak flows. Each porous pavement application must be approved by the City Engineer prior to use.~~

2. Fabricated Filtration Manholes or ~~Curb~~ Inlets

   a. Several patented filtration devices are now available that can effectively reduce sediment discharges such as:

      1) Treatment systems such as Stormceptor
      2) Catch Basin or Curb Inlet inserts such as FloGard~~Flowgard~~ Plus manufactured by Hancor, Inc. or Hydro-Kleen manufactured by ACF Environmental.
      3) ~~Surface drainage systems such as Drain-rite manufactured by Hancor Inc.~~
      4) Or several non-patented devices by various highway departments, etc.

3. Post Construction Sediment Basin~~RETENTION FACILITIES~~

   a. Sediment Basin volume, or WQV, shall be based on the following calculation:

      $WQV\ (ft^3) = (P/12)(R_v)(A*43{,}560)$
      Where
      P = rainfall depth = 1 inch
      R_v = volumetric runoff coefficient = 0.05 + 0.009I
      I = percent impervious cover (in percent, e.g. 80% = 80)
      A = total site area in acres

   b. The inlet should be designed to prevent short-circuiting between entrance and discharge to the maximum extent practicable. This can be accomplished by providing baffles in the channel, turns in the channel, etc.
   c. The shape of the storage basin should allow for easy cleanout of sediment and debris. Proper maintenance is the responsibility of the property owner. Terrain and other site conditions will tend to dictate the shape of the facility. Sediment Basins ~~Deep, steep-sided ponds~~ with water depth greater than 4' shall be fenced ~~should be avoided or covered~~ for safety ~~of children and animals~~.
   d. The sediment basin shall include an outlet structure designed for the slow release of stored runoff to allow for sedimentation in the basin. A perforated riser wrapped in filter fabric and covered with a mound

of clean 2-inch stone is the City's preferred outlet structure. Basin shall be designed to prevent permanent standing water.

~~1. The maximum allowable flow velocity through the basin shall be 0.3 fps.~~
~~4. Outlet or Discharge Facility shall allow the slow discharge of retained flow over time so that a stagnant pool is not created.~~

The details of the design are at the discretion of the designer subject to approval of the City Engineer.

All stormwater calculation shall be signed and sealed by an Engineer licensed in the state of Missouri and submitted with the permit application for review by the City Engineer. Calculations shall be prepared in a report format.

CONSTRUCTION MATERIALS

A. See Drainage ditches maybe stabilized earth, riprap, concrete, or other durable material.
B. Retention basin inlets, basin, and outlet structures maybe of any durable material subject to the approval of the City Engineer.
C. Storm drainage pipe and culvert pipe shall~~may~~ be reinforced concrete, or dual wall polypropylene pipe.~~Corrugated Metal Pipe (CMP), or reinforced plastic subject to approval~~.

1. All pipes at a minimum must be capable of sustaining an ASHTO HS-20~~H 44-20~~ loading.
2. The use of polypropolene~~reinforced plastic~~ pipe for storm drainage at drop inlets or in areas where leaf burning is allowed is prohibited.

D. Curb Inlets

1. Shall be prefabricated or cast-in-place.

   a. Shall be place on a 4" compacted aggregate base.
   b. Reinforcement in footing shall be #4 bars on 6" centers both ways.
   c. Reinforcement in walls shall be #4 bars on 12" centers both ways.
   d. Reinforcement in lid shall be a minimum of six #4 bars placed at 45 degree angle. See detail.

2. Shall have a 10" throat galvanized steel inlet frame.
3. Cast iron manhole ring and cover, Neenah R-1537 or approved equal.
4. Cast iron step, Clay & Bailey No. 2101 or approved equal.

STORM DRAINAGE CONSTRUCTION DETAIL DRAWINGS

Construction details and sketches are attached.

END

City of Osage Beach

Code of Ordinances

Design Guidelines Section 6 – Road Cut, Utility Trench and Excavation Permit

Design Guidelines
City of Osage Beach
SECTION 6 – ROAD CUT, UTILITY TRENCH AND EXCAVATION PERMIT

(Revised ~~02 MAY - 2005 – JCB~~ August ___, 2023)

OVERVIEW

This guideline pertains to all encroachments into the City of Osage Beach street right-of-ways, street easements and utility easements including: intersections with new roadways to be dedicated to the city, private roadways or parking areas, driveways, trenches for underground utilities such as water or sewer lines and any other underground utility, aerial utility lines, and roadway appurtenances.

PERMITS

A. A City of Osage Beach Road Cut and Utility Trench Permit is required prior to any encroachments into or over city right-of-ways or easements.

B. A City of Osage Beach Excavation Permit is required for any excavation of more than 50 cubic yards and/or cut or fill which change existing elevations by more than two feet.

GENERAL

A. Timely notice of work is required:

1. The applicant shall notify the city Building Official not less than twenty-four (24) hours in advance of any work in the city right-of-way or easements.
2. Additional notice shall be given to the City Building Official by telephone (573-302-2030) four (4) hours prior to actual excavation so that a City Inspector can be dispatched to carry out the required inspection.
3. As a general rule inspections will not be made on weekends or official city holidays. In the case of an emergency good judgment shall rule.

B. Timely completion of the work is required:

1. Disruption of public access or use shall be minimized to the maximum extent practicable.
2. Work within the city right-of-way or easement shall be done on a continuous basis, i.e.: once work is started it shall be continuous during normal work hours on a continual basis until completed.
3. Leaving open trenches or other excavations for more than forty-eight (48) hours is prohibited.

C. Traffic control, signs, and barricades:

1. All open trenches or excavations within street right-of-ways or easements shall be provided with appropriate warning signs and barricades.
2. If street traffic is interfered with appropriate flagman shall be provided.
3. All traffic control activities and devices shall conform to the U. S. Department of Transportation Manual of Uniform Control Devices.
4. If the excavated trench is to remain open or surface repairs to the street not completed prior to darkness appropriate warning lights shall be provided.
5. The applicant shall maintain all traffic control devices for the duration of the work.
6. At least one traffic lane shall be maintained in usable condition at all times.
7. All trenches within the traveled way shall be closed during nighttime hours.
8. No work will be permitted within the city right-of-way or easements over weekends or holiday periods.

INTERSECTIONS, PARKING AREAS, AND DRIVEWAYS

A. Prior to construction for all proposed intersections with new streets, parking areas and driveways the applicant shall:

1. Obtain an encroachment permit.
2. Submit a drawing showing horizontal and vertical alignment of the intersecting facility and all storm drainage facilities.

B. Intersecting streets and parking areas shall conform to the City of Osage Beach Design Standards for width, alignment, and grade.

1. Intersecting streets and parking areas shall have curb and gutters.
2. Streets, parking areas and driveways shall intersect perpendicular to the city street to the maximum extent practicable.

C. Minimum width for driveway entrances to commercial properties shall be twelve (12) feet for a one-way entrance and twenty-four (24) feet for two-way entrances. Minimum radius for flares shall be fifteen (15) feet.

D. Driveways for private residences shall be a minimum of ten (10) feet of driving surface exclusive of flares. Minimum radius for flares shall be ten (10) feet.

E. All entrances into city streets shall be designed and constructed to accommodate storm drainage run-off.

1. Appropriate catch drains shall be provided to accommodate run-off from or into driveways.

2. Where roadway ditches exist on the city street appropriate culverts, swales, or slotted drains shall be provided.

UTILITY TRENCHES

A. Utility trenches traversing under a city roadway.

1. Saw cut all pavement surfaces.
2. All utility lines, except storm sewer, across city right-of-ways shall be incased in Schedule 40 or SDR 21 PVC sleeve.
3. The sleeve shall be not less two inches in inside diameter larger than the maximum outside diameter of the widest dimension of the utility duct or pipe to be run through the sleeve.
4. The minimum depth of cover of the sleeve shall be:

    a. In accordance with Section 2 - Water Systems for waterlines
    b. In accordance with Section 3 - Sewerage Design for sanitary sewer
    c. In accordance with Section 4 - Storm Drainage for storm sewer
    d. 36 inches below finished pavement grade for all others or as described in this Section.

5. The maximum depth of cover for all water and sewer lines shall be eight (8) feet unless specifically authorized in writing by the City Engineer.

6. Select Backfill shall be installed:

    a. From six inches below the utility to eighteen inches below the finished pavement grade for water, pressure sewer and primary power lines.
    b. From four inches below the utility to 9 inches below the finished pavement grade for storm sewer and secondary power lines.

    Select backfill shall be 95% of maximum density nominal ½ inch minus crushed rock conforming to MoDOT Section 1004, Grade D, Chat, pea-gravel or Osage River Sand. Any material used shall have a PI of six or less.

7~~6~~. Concrete Backfill:

    a. Shall be installed from three inches below finished pavement grade to the top of the Select Backfill.
    b. The top six inches of the concrete backfill shall be extended not less than twelve inches on each side of the utility trench.
    c. Shall conform to MDOT Section 501, Concrete.

        1) Concrete shall be Class A-1

2) Course aggregate shall be Gradation B
3) Fine aggregate shall be Class A
4) Cement shall be either Type I or III.
5) An accelerator may be used in conformance with MoDOT Section 1054.5.

8~~7~~. Asphalt Pavement

a. Shall be installed from the surface to three (3) inches below finished grade.
b. Asphalt pavement shall conform to MoDOT Section 403; Type 1B
c. Asphalt cement shall be AC-30
d. Concrete backfill as specified above maybe utilized in lieu of asphalt pavement with prior permission of the City Engineer.
e. Finish Tolerance the surface of the finished roadcut shall not exceed ¼ inch below a ten (10) foot straight edge as measured below the straight edge.

B. Utility trenches paralleling under a city roadway or parking area.

1. Saw cut all pavement surfaces.
2. The minimum depth of cover shall be:

a. In accordance with Section 2 - Water Systems for waterlines
b. In accordance with Section 3 - Sewerage Design for sanitary sewer
c. In accordance with Section 4 - Storm Drainage for storm sewer
d. 24 inches below finished pavement grade for all others or as described in this Section.

3. Select Backfill shall be installed:

a. From six inches below the utility to three (3) inches below the finished pavement grade.
b. Select backfill shall be 95% of maximum density nominal ½ inch minus crushed rock conforming to MoDOT Section 1004, Grade D, Chat, pea-gravel or Osage River Sand. Any material used shall have a PI of six or less.

4. Asphalt Pavement

a. Shall be installed from the surface to three (3) inches below finished grade.
b. Asphalt pavement shall conform to MoDOT Section 403; Type 1B
c. Asphalt cement shall be AC-30
d. Concrete backfill as specified above maybe utilized in lieu of asphalt pavement with prior permission of the City Engineer.

e. Finish Tolerance the surface of the finished roadcut shall not exceed ¼ inch below a ten (10) foot straight edge as measured below the straight edge.

C. Utility trenches out of traffic area

1. The minimum depth of cover shall be:

a. In accordance with Section 2 - Water Systems for waterlines
b. In accordance with Section 3 - Sewerage Design for sanitary sewer
c. In accordance with Section 4 - Storm Drainage for storm sewer
d. 24 inches below finished pavement grade for all others or as described in this Section.

3. Select Backfill shall be installed:

a. In accordance with Section 2 - Water Systems for waterlines
b. In accordance with Section 3 - Sewerage Design for sanitary sewer
c. In accordance with Section 4 - Storm Drainage for storm sewer
d. 6 inches below the utility line to 12 inches above the utility line for all others.

4. Backfill shall be granular material or select soil excavated from the trench, free of rocks over ½ inch in least dimension, foreign material or frozen earth.

a. Backfill shall be compacted to 95% of optimum density at optimum moisture content.
b. The surface shall be graded to smooth flowing lines blending into surrounding slopes.

5. Restore disturbed surface area to pre-construction condition (seed & mulch, decorative rock, etc.).

D. Utility trenches more than 150 feet in length shall have an impervious clay or bentonite plug constructed at each terminus or intersection with other trenches to prevent water from following the trench line and creating drainage problems.

E. Underground Primary Power Trenches. All electrical power of 480 volts AC or more is considered "primary power".

1. Must comply with all Ameren Missouri specifications. ~~All primary power shall be installed in Schedule 40 PVC conduit, or as approved by the City Engineer~~.

~~2. Primary power trenches shall be a minimum of thirty-six (36) inches in depth.~~

~~3. All primary power shall have a warning barrier of Portland cement concrete backfill a minimum of three (3) inches thick by the width of the trench located three inches above the power duct.~~

~~4. An approved warning tape shall be installed six inches above the concrete barrier.~~

2~~5~~. Where underground primary power crosses city utilities, the primary power shall be a minimum of one-foot below.

3~~6~~. Where primary power line parallels a city utility line it shall be separated by a minimum of four feet.

~~7. In special circumstances with prior written approval of the City Engineer primary power may be run in the same trench as water or sewer lines, the primary power shall be in conduit and located not less than one-foot below the water or sewer line with the concrete barrier and warning tape in place.~~

F. Underground Secondary Power Trenches, all electrical power less than 480 volts.

1. Must comply with all Ameren Missouri specifications.
2. Where secondary power will be owned by the City, the following shall apply:

a~~1~~. Secondary power trenches shall be a minimum of twenty-four (24) inches of cover in depth.

b~~2~~. An approved warning tape shall be installed twelve inches above the duct.

c~~3~~. Underground secondary power ducts can be co-located with water or sewer lines if they are placed not less than one foot to the side and at or below the elevation of the water or sewer line.

d~~4~~. Where secondary power crosses water or sewer lines, the power shall be in conduit and shall be a minimum of one-foot below water or sewer lines.

ROAD BORES

In all location where the utility is to be installed under a paved area that has been constructed within the previous five (5) years, as determined by the city engineer, a road bore shall be constructed. The minimum depth of the bore shall be thirty-six (36) inches. All bores shall be sleeved as specified above.

AERIAL UTILITIES

A. Minimum vertical clearance for aerial utilities shall be a minimum of eighteen feet (18 ft. 0 in.) at the lowest point of crossing above the finished pavement grade of any city street.

B. Utility poles shall not be located less than three (3) feet from the edge of pavement on city streets or parking areas.

ROADWAY APPURTENANCES

A. Traffic control signs shall be installed in accordance with US Department of Transportation and Federal Highway Administrations Uniform Manual of Traffic Control Devices.

B. Other signs.

1. A City of Osage Beach Sign Permit is required for all signs within city right-of-ways or easements except traffic control signs.

C. No sign shall be installed within three (3) feet of the edge of pavement.

D. Mailbox.

1. Mailboxes and/or newspaper boxes shall not be located within twelve (12) inches of the edge of pavement on city streets.
2. If the street has concrete curb and gutter the face of the mailbox shall not protrude into the roadway past the back of the curb.
3. Mail and newspaper boxes shall be removed within thirty days of cessation of delivery service. If the box is unused and not removed the city will remove it at the owner's expense.

E. Guard Rail or Crash Barrier

1. Shall only be installed at locations where a severe traffic safety hazard exists and only with the approval of the City Engineer.
2. Installation shall conform to MoDOT Specifications.

INSPECTIONS

During the progress of the work each utility line shall be inspected by the Engineering Department prior to trench backfill.

ROADCUT AND UTIITY TRENCH CONSTRUCTION DETAIL DRAWINGS

Construction details and sketches are attached.

END.

[***REMOVE TYPICAL DETAIL PRIMARY POWER TRENCH DRAWING***]