Appendix D

Post-Construction SW Management Ordinance & Design Criteria (Adopted Dec. 2020)

Ordinance 20-098 Post-Construction Stormwater Management Ordinance Pg. D-1

WHEREAS, current St. Charles County stormwater requirements ordinances govern the management of flow rate/flood control for larger storm events and the preservation of watercourse buffers, tree canopy, and other environmental conservation practices that promote the filtration and infiltration of stormwater; and

WHEREAS, revisions to the current regulations are necessary to allow St. Charles County to remain in compliance with the minimum requirements of the federal Clean Water Act and the State of Missouri’s MS4 Stormwater Discharge permit; and

WHEREAS, under new regulations, stormwater runoff from our smaller and more frequent storm events will be required to be managed and treated for water quality (to reduce volume/pollution) and stream channel protection (to reduce erosion) in addition to the existing regulations; and
WHEREAS, compliance with the new regulation will be accomplished with facilities that intercept and infiltrate, evaporate, store and re-use, filter, and/or slowly release stormwater back into the natural system; and

WHEREAS, several sections of the ordinance are being revised to accommodate our new requirements for stormwater quality management in post-construction development (permanent stormwater management facilities that are different from traditional stormwater detention basins – these practices/facilities manage, filter and reduce, volumes of runoff from smaller storm events as opposed to controlling peak-flowrates of larger storm events); and

WHEREAS, any request for variances to Chapter 405 non-use regulation requirements and any appeals from county official’s decisions regarding Chapter 405 requirements may be made to the Board of Zoning Adjustments pursuant to section 405.639; and any request for variances to Chapter 410 due to practical difficulties with the property or particular hardships may be made to the Planning and Zoning Commission and Governing Body pursuant to Section 410.480; and requests for waivers of Land Disturbance/Erosion Sediment Control permitting requirements other than those already exempted under Section 412.050, may be made to the Director of Development Review pursuant to Section 412.070; and pursuant to section 412.180 governing the use of design manual and other guidelines, the manuals are not intended to preclude use of other erosion and sediment control methods not included therein, but rather, engineering professionals are encouraged to design innovative ways to address site specific conditions.
subject to approval by the Director of Development Review, compliance with regulations and the terms and conditions of applicable Federal and State permits.

NOW, THEREFORE, BE IT ORDAINED BY THE COUNTY COUNCIL OF ST. CHARLES COUNTY, MISSOURI, AS FOLLOWS:

Section 1. Section 132.040, OSCCMo. is hereby amended as follows (additions and updated information in bold type and deletions [bracketed and stricken]):

Section 132.040 Responsibilities.

A. The Director of the Department of Community Development shall be responsible, through the Division of Planning and Zoning, for the administration of the zoning and subdivision regulations in Chapters 405 and 410 of the Unified Development Ordinance of St. Charles County and for all associated functions, including enforcement except as otherwise provided pursuant to Section 132.040(C) of this Chapter.

B. The Director of the Department of Community Development shall be responsible, through the Division of Development Review, for reviewing, amending, and updating the "Design Criteria for the Preparation of Improvement Plans" originally issued in February 2002 by the St. Charles County Highway Department, as amended thereafter; reviewing and approving plans pursuant to the regulations in Chapters 405, 410 and 412 of the Unified Development
Ordinance of St. Charles County; and for managing public works projects undertaken for neighborhood improvement districts established by St. Charles County, and for all associated functions, including enforcement except as otherwise provided pursuant to Section 132.040(C) of this Chapter.

C. The Director of the Department of Community Development shall be responsible, through the Division of Building and Code Enforcement, for the administration and enforcement of the Building Codes of St. Charles County adopted in Chapter 500, Ordinances of St. Charles County, Missouri, and for all associated functions.

Section 2. Section 405.060, OSCCMo. is hereby amended as follows (additions and updated information in **bold** type and deletions [bracketed and stricken]):

Section 405.060 Definitions.

For the purpose of Chapter 405, Chapter 410 and Chapter 412, the following words and terms used herein are defined to mean the following:
Words used in present tense include the future; words in the singular number include the plural, and words in the plural number include the singular; the word "building" includes the word "structure"; the word "shall" or the word "must" is mandatory and not directory; the term "used for" includes the meaning "designed for" or "intended for."
ACCESSORY BUILDING
A subordinate building having a use customarily incidental to and located on the lot occupied by the main building.

ACCESSORY STRUCTURE
See APPURTENANT STRUCTURE.

ACCESSORY USE
A use customarily incidental to the main use of the property.

ADMINISTRATOR
The Federal Insurance Administrator.

ADULT ARCADE
Any place to which the public is permitted or invited wherein coin-operated, slug-operated, or for any form of consideration, electronically, electrically, or mechanically controlled still or motion picture machines, projectors, video or laser disc players, or other image-producing devices are maintained to show images to five (5) or fewer persons per machine at any one time, and where the images so displayed are distinguished or characterized by the depicting or describing of "specified sexual activities" or "specified anatomical areas".

ADULT BOOKSTORE—ADULT NOVELTY STORE—ADULT VIDEO STORE
A commercial establishment that has as a substantial or significant portion of its stock-in-trade and offers for sale, for any form of consideration, any one (1) or more of the following:

1. Books, magazines, periodicals, or other printed matter, or photographs, films, motion
pictures, video cassettes or disks, slides, or other visual representations that are characterized by an emphasis upon the depiction or description of specified sexual activities or specified anatomical areas; or

2. Instruments, devices, or paraphernalia that are designed or marketed for use in connection with specified sexual activities.

A commercial establishment may have other principal business purposes that do not involve the offering for sale or rental of material depicting or describing specified sexual activities or specified anatomical areas and still be categorized as "adult bookstore", "adult novelty store" or "adult video store". Such other business purposes will not serve to exempt such commercial establishments from being categorized as an "adult bookstore", "adult novelty store" or "adult video store" so long as one (1) of its principal business purposes is the offering for sale or rental for consideration the specified materials which are characterized by the depiction or description of specified sexual activities or specified anatomical areas.

**ADULT CABARET**

A nightclub, bar, restaurant, or similar establishment that regularly features live performances that are characterized by the exposure of specified anatomical areas or by specified sexual activities, or films, motion
pictures, video cassettes or disks, slides, or other photographic reproductions in which a substantial or significant portion of the total presentation time is devoted to the showing of material that is characterized by an emphasis upon the depiction or description of specified sexual activities or specified anatomical areas.

ADULT DAY CARE
A group program designed to provide care and supervision to meet the needs of five (5) or more functionally impaired adults (age eighteen (18) or older) for periods of less than twenty-four (24) hours but more than two (2) hours per day in a place other than the adult's own home.

ADULT MOTEL
A hotel, motel or similar commercial establishment which:

1. Offers accommodations to the public for any form of consideration; provides patrons with closed-circuit television transmissions, films, motion pictures, video cassettes or disks, slides, or other photographic reproductions which are characterized by the depiction or description of specified sexual activities or specified anatomical areas, and has a sign visible from the public right-of-way which advertises the availability of this adult type of photographic reproductions;

2. Offers a sleeping room for rent for a period of time that is less than ten (10) hours; or
3. Allows a tenant or occupant of the sleeping room to subrent the room for a period of time that is less than ten (10) hours. Evidence that a sleeping room in a hotel, motel, or a similar commercial establishment has been rented and vacated two (2) or more times in a period of time that is less than ten (10) hours creates a rebuttable presumption that the establishment is an adult motel.

ADULT MOTION PICTURE THEATER
An establishment where, for any form of consideration, films, motion pictures, video cassettes or disks, slides, or similar photographic reproductions are shown, and in which a substantial or significant portion of the total presentation time is devoted to the showing of material characterized by an emphasis on the depiction or description of specified sexual activities or specified anatomical areas.

ADULT THEATER
A theater, concert hall, auditorium, or similar establishment in which a substantial or significant portion of the presentation time is devoted to the exposure of specified anatomical areas or to specified sexual activities.

AGRICULTURAL AND FARM BUILDINGS
Any building which is necessary or incidental to the normal conduct of a farm as defined herein (see Farm), including, but not limited to, residence of the operator, residence of full-time farm employees; barns, buildings and sheds for housing livestock, poultry and farm machinery; buildings
for the storage or shelter of grain, hay and other crops; silos, windmills and water storage tanks.

AGRICULTURAL COMMODITIES
Agricultural products and livestock.

AGRICULTURAL STRUCTURE
Any structure used exclusively in connection with the production, harvesting, storage, drying, or raising of agricultural commodities.

AGRICULTURE OR FARMING
The planting, cultivating, harvesting, and storage of grains, hay, or plants, vineyards, or trees commonly grown in St. Charles County. The raising and feeding of livestock and poultry shall be considered an agricultural venture if the area in which the livestock or poultry is kept contains ten (10) acres or more in area, and if such raising of livestock and poultry is incidental or supplemental to the raising of crops.

AIRPORT
A facility for servicing take-off/landing aircraft having a runway or runways and open to public use, but not necessarily to all types of aircraft.

ALLEY
A right-of-way which affords a secondary means of access to abutting property.

ALTERATION
As applied to a building or a structure, a change or rearrangement in the structural parts; or an enlargement, whether by extending on a side or by increasing in height; or the moving from one location or position to another.
AMUSEMENT GAME MACHINE
A coin or token-operated machine or device which, whether mechanical, electrical, or electronic, shall be ready for play by the insertion of a coin or token, and may be operated by the public for use as a game, entertainment, or amusement, the object of which is to achieve either a high or low score, which, by comparison to the score of other players, whether playing concurrently or not, demonstrates relative skill or competence, or indicates in any other way competitive advantage of one (1) player or team over another, regardless of skill or competence. It shall include devices such as pinball machines or any device which utilizes a video tube to reproduce symbolic figures and lines intended to be representative of real games or activities.

AMUSEMENT GAME MACHINE COMPLEX
A group of more than three (3) amusement games or other amusement machines, in the same place, location, or premises.

ANIMAL, EXOTIC OR WILD
An animal which is not of a species customarily used as a household pet, but one which would ordinarily be confined to a zoo, or one which would ordinarily be found in the wilderness of this or any other country, or one which otherwise causes a reasonable person to be fearful of bodily harm or property damage.

ANIMAL FEEDLOT
A lot or building, or combination of contiguous lots and buildings, intended for the confined feeding, breeding, raising, or holding of animals and specifically designed as a confinement area in
which manure may accumulate, or where the concentration of animals is such that a vegetative cover cannot be maintained within the enclosure. For purposes of these parts, open lots used for feeding and rearing of poultry (poultry ranges) and barns, dairy facilities, swine facilities, beef lots and barns, horse stalls, mink ranches and domesticated animal zoos, shall be considered to be animal feedlots. Pastures shall not be considered animal feedlots under these parts.

**ANIMAL, PET**
See PETS.

**ANIMAL, PET, DOMESTIC OTHER**
See PETS, DOMESTIC OTHER.

**ANIMAL UNIT**
Unit of measure used by the Environmental Protection Agency and the State of Missouri in the regulation of animal feedlots. The average weight of animal divided by one thousand (1,000) pounds equals animal units. The following animals are rated in terms of animal units and adopted by the State of Missouri and St. Charles County.

<table>
<thead>
<tr>
<th>Animal</th>
<th>Head per Animal Unit</th>
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<tr>
<td>broiler</td>
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<tr>
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<tr>
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<tr>
<td>sheep</td>
<td>10.0</td>
</tr>
<tr>
<td>slaughter steer or heifer</td>
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</tr>
<tr>
<td>swine over 55 lbs.</td>
<td>2.5</td>
</tr>
<tr>
<td>swine under 55 lbs.</td>
<td>15.0</td>
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<tr>
<td>Animal</td>
<td>Head per Animal Unit</td>
</tr>
<tr>
<td>--------</td>
<td>----------------------</td>
</tr>
<tr>
<td>turkey</td>
<td>55.0</td>
</tr>
</tbody>
</table>

ANTENNAS
Any device used to collect or radiate electromagnetic waves for the provision of cellular, paging, personal communications services (PSC) and microwave communications. Such structures and devices include, but are not limited to, directional antennas, such as panels, microwave dishes and satellite dishes and omnidirectional antennas, such as whips.

APARTMENT
A room or a suite of rooms within a building, provided with separate cooking facilities and intended as a single dwelling unit.

APPEAL
A request for a review of the Director of the Division of Planning and Zoning's interpretation of any provision of this Chapter or Chapter 410 or a request for a variance.

The entire area within the boundary lines of the territory proposed for the subdivision, including the area to be dedicated for street and alley right-of-way and public use.

AREA, NET
The entire area within the boundary lines of the territory proposed for the subdivision, less the area to be dedicated for street and alley right-of-way and public use.

AREA OF LOT
The extent of space within a lot, not including right-of-ways of streets and alleys.

**AREA OF SPECIAL FLOOD HAZARD**
Land in the floodplain within a community subject to a one percent (1%) or greater chance of flooding in any given year.

**ARTERIAL**
A highway or street designated as a major thoroughfare in the current Master Plan as approved by the Governing Body for St. Charles County, Missouri.

**BAR OR TAVERN**
An establishment serving alcoholic beverages in which the principal business is the sale of such beverages at retail for the consumption on the premises.

**BASE AREA OF MAIN STRUCTURE**
The square feet of floor space within the outside line of walls and includes the total of all finished space on the main floor of a building. It does not include porches, garages or rooms without heating and/or air-conditioning.

**BASE FLOOD**
A flood having a one percent (1%) chance of being equalled or exceeded in any given year.

**BASEMENT**
Any area of the building having its floor subgrade (below ground level) on all sides.

**BED AND BREAKFAST INN**
A facility for overnight lodging where five (5) or more bedrooms are available to the transient public for overnight stay; where there is one (1) off-street parking space for each guest room and for the host;
also where breakfast is served. Typically, the host personally interacts with guests in order to better acquaint the guests with the community, and provides hospitality such as that being afforded any house guest.

**BED AND BREAKFAST RESIDENCE**
A single-family residence where the host must live in the residence; where there are between one (1) and five (5) guest rooms to house transient guests for overnight stay; where there is one (1) off-street parking space for each guest room and two (2) off-street parking spaces for the residence; also where breakfast is served. Typically the host personally interacts with guests in order to better acquaint the guests with the community, and provides hospitality such as that being afforded any house guest.

**BENCHMARK**
An identifiable definite point of known elevation and location and of more or less permanent character on M.S.G.S. Datum.

**BILLBOARD**
Any structure, or portion thereof, not exceeding six hundred seventy two (672) square feet upon which an advertisement is placed, painted, or printed, advertising a person, thing, product, or service not located or sold on the property on which the sign is located, but not including official governmental notices.

**BLACKSMITH SHOP**
A workshop with a furnace where metal is heated and wrought, where wrought iron is produced,
where iron is made malleable, and/or where metal is formed by heating and hammering.

**BLOCK**
A piece or parcel of land entirely surrounded by public or private highways or streets, other than alleys. In cases where the platting is incomplete or disconnected, the Director of the Division of Planning and Zoning shall determine the outline of the block.

**BOARDING HOUSE OR LODGING HOUSE**
A building other than a hotel, occupied as a single housekeeping unit, where lodging or meals are provided for three (3) or more persons for compensation, pursuant to previous arrangements, but not for the traveling public or transients.

**BOARD OF ZONING ADJUSTMENT (BZA)**
A body of persons which may determine and vary the regulations contained within the ordinance in accordance with the provisions within Part 7, Sections 405.590 et seq.

**BOAT**
A water vessel propelled by oars, paddles, sail or power.

**BOAT BROKERAGE**
An agent who negotiates contracts of purchase and sale of boats.

**BODY PIERCING**
Any method of piercing the skin or mucosa in order to place any object including, but not limited to, rings, studs, bars or other forms of jewelry through the skin or mucosa. Chapter 645 expressly excludes ear piercing, as defined in Section 645.080(B), as a body piercing procedure.
BREWERY
An industrial use that brews ales, beers, meads and/or similar beverages for sale and consumption off premises.

BREWHOUSE
One (1) or more buildings, structures and open spaces utilized for brewing of beer, or cider and/or distilling of spirits for both on-site and off-site sale and consumption, with or without subsidiary accessory uses including but not limited to the preparation of food, sale and service of prepared food indoors and outdoors, conducting of weddings and/or wedding receptions or other private parties, and tours of the brewhouse.

BROADCAST FACILITY
A facility that generally consists of an equipment building and a guyed or self-support tower, typically constructed of lattice or tubular steel that supports AM/FM radio and/or VHF or UHF television antennas. The antenna weight ranges from three thousand (3,000) to ten thousand (10,000) pounds. With the exception of AM, these towers are usually located on high ground, as the technology requires "line of sight" between the transmitter and the signal receivers. The facility transmits power levels, measured at the antenna as effective radiated power (ERP), that typically exceed fifty thousand (50,000) watts and may reach five million (5,000,000) watts.

BUILDING
An enclosed structure, anchored to permanent foundation, having exterior or party walls and a
roof, designed for the shelter of persons, animals, or property.

BUILDING LINE, FRONT
A line which establishes the required front yard and is generally parallel with the front property line.

CABIN
A building used primarily as weekend or short-term living quarters by persons partaking of recreational activities in the general vicinity. The same regulations shall apply to cabins as apply to dwellings, except when specifically excluded.

CALIPER
The diameter of a trunk six (6) inches above grade.

CAMPGROUNDS
Land used or intended to be used, let, or rented for temporary occupancy for recreational purposes by one (1) or more persons for camping.

CANOPY
A roof-like cover having no supporting walls, but supported otherwise from the ground, deck, floor, or walls of the building.

CENTRALIZED YARD WASTE COMPOSTING FACILITY
A commercial facility where yard waste is accepted from the public for composting. Composting is an aerobic (oxygen-dependent) degradation process by which organic wastes decompose under controlled conditions. Yard waste shall be defined as leaves, grass clippings, yard and garden vegetation, Christmas trees, shrubs, vegetable and flower garden waste, and brush, produced as a result of lawn and garden care and maintenance.
CHANNEL
A natural or artificial watercourse of perceptible extent, with definite beds and banks to confine and conduct continuously or periodically flowing water. Channel flow, thus, is that water which flows within the limits of a defined channel.

CHURCH
A building principally used for religious purposes, which shall include, but not be limited to, rectories, parish houses, convents, monasteries, temples, and synagogues.

CLEAN FILL
Uncontaminated soil, rock, sand, gravel, concrete, asphaltic concrete, cinder blocks, brick, minimal amounts of wood and metal, and inert solids as approved by rule or policy of the Missouri Department of Natural Resources for fill, reclamation, or other beneficial use. This definition does not include the use of clean fill for raising any residentially zoned property above the existing grade unless the purpose of the clean fill is to raise the first (1st) floor of a structure one (1) foot above the 100-year floodplain. The exclusion of clean fill in residentially zoned subdivisions above the existing grade would only be applicable after the completion of an interim grading and sediment and erosion control plan by the developer.

CLEARING
Any activity that removes, cuts down or covers up vegetative cover of land.
CLINIC
An establishment where patients are not lodged overnight, but are admitted for examination and treatment.

CLUB (private)
A building or portion of a building intended to be used as a center of informal association for a selective membership not open to the general public. The building could be used by persons for recreational and eating purposes, but not for dwelling purposes other than managerial or transient lodging.

CLUSTER DEVELOPMENT
A residential use that divides land into not more than the number of lots permissible in a conventional subdivision of the same property in the same zoning district, but where the lot areas are reduced in order to gain common open space and reductions in other lot requirements may be considered. Residential units may be single-family or attached single-family, however, units platted through this procedure must all have ground floor living space and not stacked vertically on top of another unit.

COLLECTOR
See STREET, COLLECTOR.

COMMERCIAL VEHICLE
A vehicle, truck or bus designed to carry passengers, freight and/or merchandise with one (1) or more of these characteristics:

1. Licensed by a State as a commercial vehicle;
2. Exceeds twenty-four (24) feet in length;
3. Conveys a commercial message; or

4. Has materials stored on the vehicle's exterior such as ladder, tools, etc.

**COMMISSION**
The Planning and Zoning Commission of St. Charles County.

**COMMON GROUND**
That land set aside for open space or recreational use for the owners of the residential lots in a subdivision, which land is conveyed by the developer to trustees whose trust indenture shall provide that said common ground be used for the sole benefit, use, and enjoyment of the lot owners present and future. No lot owner shall have the right to convey interest in the common ground, except as an incident of the ownership of a regularly platted lot.

**COMMUNITY**
Any State or area, or political subdivision thereof, which has authority to adopt and enforce floodplain management regulations for the areas within its jurisdiction.

**COMPOSTING FACILITY**
See CENTRALIZED YARD WASTE COMPOSTING FACILITY.

**CONDITIONAL USE**
A use allowed in a zoning district after a permit is granted, in accordance with the provisions within Part 4 of Chapter 405, Sections 405.510, et seq.

**CONDOMINIUM**
A form of ownership in which the interior space of a living unit is held by an individual owner, with
all individual owners sharing in the ownership of common areas.

CONFERENCE/EVENTS/LODGING CENTER
A facility with meeting rooms and places for conferences, meetings, weddings and other public assemblies, which may include a hotel or motel to accommodate either persons attending such public assemblies or travelers.

CONIFEROUS TREES
Trees at least ten (10) feet tall at maturity, which usually have green foliage throughout all seasons of the year in Missouri.

CONCEPT PLAN
A drawing or plan illustrating the intended use of the property, and any proposed improvements, prepared in accordance with the requirements in Section 405.523 of the Unified Development Ordinance.

CONSTRUCTION, EXISTING (for the purpose of determining rates)
Structures for which the "start of construction" commenced before September 15, 1978. "Existing construction" may also be referred to as "existing structures." This term applies to the "FW", "FF", and "DF" Overlay Districts.

CONSTRUCTION, NEW
New construction means those structures where new construction or substantial improvement which commenced after September 15, 1978, the effective date of the Flood Insurance Rate Map. This term applies to the FW, FF, and DF Overlay Districts.
CONSTRUCTION PLANS
Complete construction drawings of a facility or improvement, including, but not limited to, road plans and profiles, drainage plans, and utility plans (see Improvement Plans).

CONSTRUCTION, START OF
Includes substantial improvement, and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition placement, or other improvement was within one hundred eighty (180) days of the permit date. The actual start means the first (1st) placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation or the placement of a manufactured or mobile home on a foundation. Permanent construction does not include land preparation, such as clearing, grading, and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of construction means the first (1st) alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building. This term applies to the "FW" and "FF" Overlay Districts.
COUNTY
St. Charles County, Missouri.

COUNTY COUNCIL
The body established by Article II of the St. Charles County Charter (1992) as the legislative branch of the government of St. Charles County.

COUNTY ENGINEER
The office established by Article IV, Section 4.700 et seq., of the St. Charles County Charter.

COUNTY EXECUTIVE
The office established by Article III of the St. Charles County Charter (1992) to hold executive power of St. Charles County.

CO-USE
The location of two (2) or more telecommunication antenna or devices (providers) on a single telecommunication tower.

DAYCARE CENTER
A building used for the supervision and care of more than four (4) preschool children, other than those of the operator.

DEBRIS OR SEDIMENT BASIN
A barrier or dam built across a waterway or at other suitable locations to retain rock, sand, gravel, silt, or other materials.

DENSITY
The number of dwelling units developed on one (1) acre of land.

DENSITY FLOODWAY
The adjacent portion of the floodway of the Missouri and Mississippi Rivers, as depicted on the Flood Insurance Rate Map, which permits island development on eighteen percent (18%) of a
lot/parcel in the floodplain without cumulatively increasing the water surface elevation by more than one (1) foot.

**DESIGN CRITERIA FOR THE PREPARATION OF IMPROVEMENT PLANS**

St. Charles County’s “Design Criteria for the Preparation of Improvement Plans” last published February 2002, as amended thereafter in the most recent update dated January 2021, and as amended hereinafter from time to time.

**DETENTION BASIN**

A man-made or natural water collector facility designed to collect surface and subsurfaced water in order to impede its flow and to release the same gradually at a rate not greater than that prior to the development of the property, into natural or man-made outlets.

**DEVELOPMENT**

Any man-made change to improved or unimproved real estate, including, but not limited to, buildings or other structures, levees, levee systems, mining, dredging, filling, grading, paving, excavation, or drilling operations, or storage of equipment or materials.

**DEVELOPMENT SITE**

A site in which one (1) or more lots, tracts or parcels of land are to be developed or redeveloped as a coordinated site for a complex of uses, units or structures included on a single site plan, conceptual site plan or preliminary plat.
DIRECTOR OF COMMUNITY DEVELOPMENT
The County officer responsible for the administration of the Department of Community Development pursuant to Chapter 132, Ordinances of St. Charles County, Missouri, who shall possess all other powers previously vested by order or ordinance in the former, and now abolished, Departments of Planning and Building and in the Plan Review and Neighborhood Improvement District functions of the County Highway Department.

DIRECTOR OF THE DIVISION OF BUILDING AND CODE ENFORCEMENT
The County officer appointed pursuant to Chapter 132 to direct the work of the Division of Building and Code Enforcement of the Department of Community Development and to enforce the provisions of this Chapter and Chapter 410.

DIRECTOR OF THE DIVISION OF DEVELOPMENT REVIEW
The County officer appointed pursuant to Chapter 132 to direct the work of the Division of Development Review of the Department of Community Development and to perform the functions assigned to the Division's Director by Chapter 132, this Chapter and Chapters 410 and 412.

DIRECTOR OF THE DIVISION OF PLANNING AND ZONING
The County officer appointed pursuant to Chapter 132 to direct the work of Division of Planning and Zoning of the Department of
Community Development and to enforce the provisions of this Chapter and Chapter 410.

DISTRICT
A part of the unincorporated portion of the County wherein regulations of this Chapter or Chapter 410 are uniform.

DIVERSION
A channel with or without a supporting ridge on the lower side constructed across or at the bottom of a slope.

DRIP LINE
The outermost perimeter of the crown of a plant as projected vertically to the ground.

DRY-FLOODPROOF
To protect against flood-damage as provided in 44 C.F.R. Sections 60.3(c) and 78.12(e).

DUPLEX
See DWELLING, TWO-FAMILY.

DWELLING
A building, or portion thereof, designed and used exclusively for residential occupancy.

DWELLING, MULTIPLE
A building, or portion thereof, arranged, intended or designed for occupancy by three (3) or more families, including apartment houses, row houses, tenements, and apartment hotels.

DWELLING, ONE-FAMILY
A detached building arranged, intended, or designed for occupancy by one (1) family.

DWELLING, TWO-FAMILY
A building designed exclusively for occupancy by two (2) families living independently of each other, including a duplex (one (1) dwelling unit above the
other), or a semi-detached dwelling (one (1) dwelling unit beside the other).

EASEMENT
The right to use another person's property, but only for a limited and specifically named purpose.

EASEMENT OF ACCESS
A grant by a property owner to the public, a corporation, or a person for ingress and egress purposes only.

ENGINEER
A registered professional engineer licensed by the State of Missouri.

EROSION
The wearing away of the land surface by the action of wind, water, or gravity.

ESCORT
A person who, for consideration, agrees or offers to act as a companion, guide, or date for another person or who agrees to privately model lingerie or to privately perform a striptease for another person.

ESCORT AGENCY
A person or business association who furnishes, offers to furnish, or advertises to furnish escorts as one (1) of its primary business purposes for a fee, tip or other consideration.

ESTABLISHMENT (SEXUALLY ORIENTED)
Any of the following:

1. The opening or commencement of any sexually oriented business as a new business;

2. The conversion of an existing business, whether or not a sexually oriented business, to any sexually oriented business;
3. The additions of any sexually oriented business to any other existing sexually oriented business; or

4. The relocation of any sexually oriented business.

**EXCAVATION OR CUT**

The removal, stripping, or disturbance of soil, earth, sand, rock, gravel, or other similar substances from the ground.

**EXEMPTED QUANTITY**

For each hazardous substance, a weight less than the Final Reportable Quantity listed on the U.S. Environmental Protection Agency's List of Hazardous Substances, 40 CFR 302.4. For each extremely hazardous substance, a weight less than the Reportable Quantity listed on the U.S. Environmental Protection Agency's List of Extremely Hazardous Substances, 40 CFR 355, Appendix A. For any liquid petroleum product not listed as a hazardous or extremely hazardous substance, a quantity of sixty (60) gallons or less. Where regulated substances are dissolved in or mixed with other non-regulated substances, only the actual quantity of the regulated substance present shall be used to determine compliance with the provisions of this Chapter. The exempted quantity shall be measured as the total quantity of that substance per facility at any one time.

**EXISTING CONSTRUCTION**

See CONSTRUCTION, EXISTING.
EXISTING GRADE
The vertical location of the existing ground surface prior to excavation or filling.

EXTREMELY HAZARDOUS SUBSTANCE
See REGULATED SUBSTANCE.

FAMILY
One (1) or more persons who are related by blood, marriage or adoption, living together and occupying a single housekeeping unit.

FARM
A parcel of land used for growing or raising agricultural products, including related structures thereon.

FARM STAND
A temporary structure and/or land area not to exceed a gross floor and/or ground area of five hundred (500) square feet from which agricultural products produced on the premises are sold to the general public.

FARM STAND, COMMERCIAL
A structure used for the retail sales of fresh fruits, vegetables, flowers, herbs or plants grown on the premises and may be augmented by imported products of the same type. The accessory sales of other unprocessed foodstuffs, home processed food products such as jams, jellies, pickles, sauces or baked goods and homemade handicrafts may also be considered. The floor area devoted to the sales of these accessory items shall not exceed fifty percent (50%) of the total sales area. No commercially packaged handicrafts or commercially processed or packaged foodstuffs shall be sold at a commercial farm stand.
FEMA
Federal Emergency Management Agency.

FENCES
An enclosure or barrier, such as wooden posts, wire, iron, etc., used as a boundary, means of protection, privacy screening or confinement, but not including hedges, shrubs, trees or other natural growth.

FILL OR FILLING
The placing of any soil, earth, sand, rock, gravel, or other substance on the ground.

FINAL PLAT
See PLAT, FINAL.

FINISHED GRADE
The final grade or elevation of the ground surface conforming to the proposed design.

FLOOD OR FLOODING
A general and temporary condition of partial or complete inundation of normally dry land areas from:

1. The overflow of inland and/or;

2. The unusual and rapid accumulation of runoff of surface waters from any source.

FLOOD BOUNDARY AND FLOODWAY MAP (FBFM)
An official map of a community on which the Administrator has delineated both special flood hazard areas and the designated regulatory floodway.

FLOOD ELEVATION DETERMINATIONS
A determination by the Federal Insurance Administrator of the water surface elevations of the
base flood: that is, the flood level that has a one percent (1%) or greater chance of occurrence in any given year.

FLOOD ELEVATION STUDY
An examination, evaluation, and determination of flood hazards.

FLOOD INSURANCE RATE MAP (FIRM)
An official map of a community on which the Federal Insurance Administrator has delineated both the special flood hazard areas and the risk premium zones applicable to the community.

FLOOD INSURANCE STUDY (FIS)
An examination, evaluation, and determination of flood hazards and, if appropriate, corresponding water surface elevations.

FLOOD PROOFING
Any combination of structural and non-structural additions, changes, or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures, and their contents.

FLOOD PROTECTION SYSTEM
Those physical structural works for which funds have been authorized, appropriated, and expended, and which have been constructed specifically to modify flooding in order to reduce the extent of the area within a community subject to a "special flood hazard" and the extent of the depth of associated flooding. Such a system typically includes dams, reservoirs, levees, or dikes. These specialized flood modifying works are those constructed in conformance with sound engineering standards.
FLOODPLAIN MANAGEMENT
The operation of an overall program of corrective and preventive measures for reducing flood damage, including, but not limited to, emergency preparedness plan, flood control works, and floodplain management regulations.

FLOODPLAIN OR FLOOD PRONE AREA
Any land area susceptible to being inundated by water from any source (see FLOOD OR FLOODING).

FLOODWAY
The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one (1) foot.

FLOODWAY FRINGE
That area of the floodplain, outside of the floodway, that has a one percent (1%) chance of a flood of a 100-year magnitude in any one (1) year.

FLOOR AREA
The square feet of floor space within the outside line of walls and includes the total of all finished space on all floors of a building. It does not include porches, garages, or unfinished space in a basement.

FLOOR AREA RATIO
The ratio between the total square feet of floor area in a structure and the total square feet of land in the lot or tract on which the structure is located.

FREEBOARD
A factor of safety usually expressed in feet above a flood level for purposes of floodplain
management. "Freeboard" tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions, such as wave action, clogged bridge openings, and the hydrological effect of urbanization of the watershed.

FRONTAGE
All property on one (1) side of a street or highway, measured along the right-of-way line of the street.

GARAGE, COMMUNITY
A building, or portion thereof, providing private parking of motor vehicles for persons residing on the premises.

GARAGE, PRIVATE
An accessory building for storage of private motor vehicles located on the same property as the residence.

GARDEN CENTER
A place of business where retail and wholesale products and produce are sold to the consumer. These centers, which may include a nursery and/or greenhouses, import most of the items sold and may include plants, nursery products and stock, potting soil, hardware, power equipment and machinery, hoes, rakes, shovels and other lawn and garden variety tools, lawn and garden supplies, water gardens, outdoor furniture, irrigation equipment, mulch and yard ornaments.

GENERAL SERVICE OR REPAIR ESTABLISHMENT
Establishments primarily engaged in the provision of repair services to individuals and households,
rather than businesses, but excluding automotive and equipment repair use types. Typical uses include appliance repair shops, shoe repair, watch or jewelry repair shops or repair of musical instruments but excludes those classified more specifically by definition.

GOVERNING BODY
The executive and/or legislative branches of St. Charles County government as defined and empowered by the County Charter.

GRADE
The slope of a surface measured by the change in vertical distance versus the change in horizontal distance and specified in percent, as a ratio, or in feet per feet, and shown on a surface profile plan as required herein.

GRADE LEVEL, FINISHED
The final elevation of the ground surface after development.

GRADE LEVEL, NATURAL
The elevation of the ground surface in its natural state, before man-made alterations.

GRADING
Any excavation or filling or land disturbance, or combination thereof.

GREENBELT
A visual barrier composed of evergreen plants, trees and grass arranged to form both a low-level and a high-level screen.

GREENHOUSES
A structure whose roof and sides are made largely of glass or other transparent or translucent material and in which the temperature and humidity can be
regulated for the cultivation of delicate or out-of-season plants. The term includes cold frame structures which are temporary in nature including inflatable structures.

**GROUP HOME FACILITY**

A non-medical facility providing shelter, counseling and, where necessary, other rehabilitative services, supervision or assistance to no more than eight (8) unrelated persons who, due to mental or physical disability, pregnancy or status as a minor who is unable to live with parents or guardians, reside together in a family-type environment as a single, housekeeping unit. Such a group home facility shall have the appearance of a conventional single-family residence with a single kitchen facility. Homes recognized as Oxford Homes shall be considered group homes. Excluded from the definition of group home facility are homes established for or occupied by residents who are permitted to live in "halfway houses" including residences in which the residents are criminal offenders in work-release sentence or on parole or probation, or persons who use or are addicted to a controlled substance. A group home facility shall be a permitted use only if it has received administrative approval from the Director of the Division of Planning and Zoning as set out in Section 405.078(8) and is operated in conformance with conditions and standards specified in that Subsection and all other applicable governmental regulations and requirements.
GUYED TOWER
A structure composed of three (3) or four (4) support legs, that is, "guyed" by wires to anchors in the ground placed at radial distances from the tower, and is used to support telecommunications equipment and antennas. Generally, heights range from sixty (60) feet to five hundred (500) feet. Guyed towers are less bulky than self-support towers at the same height, location and loads.

HALFWAY HOUSE
A facility in which persons reside together by reason of probation or parole from incarceration or by reason of the terms of a criminal conviction.

HANDICAPPED PARKING SPACE
A reserved surface area not less than thirteen (13) feet wide and identified by an above-grade sign designating the space for parking by the physically disabled.

HAZARDOUS SUBSTANCE
See REGULATED SUBSTANCE.

HEIGHT OF BUILDINGS
The vertical distance from the average grade of the front yard to the highest roof surface.

HIGH PRESSURE PIPELINE
A pipeline for the transmission of any substance, including, but not limited to, crude oil, highly volatile liquids (including anhydrous ammonia), petroleum products, carbon dioxide, jet fuel, natural gas or any other derivative product thereof, any of which products are under pressure of more than three hundred fifty (350) pounds per square inch and regulated by the United States Department of Transportation.
HIGHEST ADJACENT GRADE
The highest natural elevation of the ground surface prior to construction next to the proposed walls of a structure.

HIGHWAY
See ARTERIAL.

HISTORIC SITE
A structure or place of historical significance; may be designated as such by local, State or Federal Government.

HISTORIC STRUCTURE
Any structure that is (a) listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarly determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register; (b) certified or preliminarly determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarly determined by the Secretary to qualify as a registered historic district; (c) individually listed on a State Inventory of Historic Places in States with historic preservation programs which have been approved by the Secretary of the Interior; or (d) individually listed on a Local Inventory of Historic Places in communities with historic preservation programs that have been certified either (1) by an approved State program as determined by the Secretary of the Interior, or (2) directly by the Secretary of the Interior in States without approved programs.
HOME OCCUPATION
An occupation or profession carried on by one (1) or more members of the household, residing on the premises, which is clearly incidental and secondary to the use of the dwelling unit for residential purposes, and which conforms to the standards and provisions contained within Part 3, Article IV, Section 405.495 of this Chapter.

HOSPITAL
A building used for the diagnosis, treatment, or other care of human ailments and having room facilities for overnight medical or psychiatric patients, a staff of physicians and nurses, and other related services.

HOTEL
A building occupied or used as a more or less temporary abiding place of individuals or groups of individuals who are lodged, with or without meals, including related customary services and in which there are no provisions for cooking in individual rooms.

HOUSEHOLD
Any of the following groups of individuals provided the number of individuals in a home is further regulated by Title V Building and Construction of St. Charles County, Missouri:

1. Any number of persons related by blood, marriage or adoption, plus:
   a. A domestic employee serving residents on the premises;
   b. Children under the age of eighteen (18) who may not be related to any or all of
the other residents but who are under the guardianship or in foster care of an adult resident;

2. A group including not more than two (2) adults together with any number of children related by blood or legal adoption to at least one (1) of the adults; or

3. A group of not more than three (3) adults whether or not related to one another living together as a single housekeeping unit.

IMPROVEMENT PLANS
The engineering plans showing types of materials and construction details for the physical structures and facilities to be installed both in or in conjunction with the proposed subdivision.

IMPROVEMENTS (LAND)
Refers to site grading, street pavement, monuments, sidewalks, water mains, sanitary sewers, storm sewers, street signs, and special structures, to be installed or agreed to be installed by the subdivider on land to be used for public streets.

IMPROVEMENTS (STRUCTURAL)
See ALTERATION.

INSTITUTION
A non-profit or quasi-public use, such as a church, library, public or private school, hospital, or municipally owned or operated building, structure, or land used for public purpose.

JUNK YARD
See SALVAGE YARD.
KENNEL
An establishment where dogs, cats, or other small animals are boarded for compensation, bred, or raised on a commercial scale.

LAND DISTURBANCE
Clearing or grading or any other action which results in removal, covering up or cutting down of the natural site vegetation and/or destruction of the root zone or otherwise results in leaving the ground surface exposed to soil erosion through the action of wind or water.

LAND SURVEYOR
A land surveyor registered in the State of Missouri.

LANDING FIELD
A facility for take-off and landing of aircraft, with or without services available for aircraft, which is operated for private use.

LANDSCAPE CONTRACTOR
A business principally engaged in the decorative and functional alteration, planting and maintenance of grounds. Such a business may engage in the installation and construction of underground improvements but only to the extent that such improvements (e.g., drainage systems) are accessory to the principal business and are necessary to support or sustain the landscaped surface of the ground. Vehicles, equipment and materials used in the business may be stored on-site including rock, mulch, soil and some plant material which is not grown on the site. Retail and wholesale sales of products and services are not accomplished from the site.
LANDSCAPING
The development and decorative planting of gardens, grounds, or other natural landscapes.

LARGE TREES
Deciduous shade trees with a mature height of thirty (30) feet or greater and a mature spread of thirty (30) feet or greater.

LAWN CARE SERVICE
A business devoted to cutting grass on private or public property. Such service shall not include materials or equipment used for landscaping.

LIQUID PETROLEUM PRODUCT
See REGULATED SUBSTANCE.

LIVESTOCK
Animals kept or raised for use, pleasure, or profit; typically farm animals. Shall include, but not be limited to: cattle, horses, poultry, sheep, and swine.

LOADING SPACE
A space within the main building or on the same lot for standing, loading, or unloading trucks.

LOT
A parcel of land occupied or to be occupied by one (1) main building or unit group of buildings and the accessory buildings or uses customarily incidental thereto, including such open spaces as are required under this Chapter or Chapter 410, and having its principal frontage upon a public or private street.

LOT AREA
The total horizontal area within the boundaries of a lot, exclusive of any land designated for street or alley purposes.
LOT, CORNER
A lot abutting upon two (2) or more streets at their intersection. A corner lot shall be deemed to have a front yard setback for each street.

LOT, FLAG
A lot with access provided to the bulk of the lot by means of a narrow corridor. The bulk of the lot with the exception of the access area must meet the minimum lot width and area requirements for the district in which the lot is located.

LOT LINE, FRONT
The boundary line between a lot and the street right-of-way on which it borders.

LOT LINE, REAR
The boundary line which is opposite and most distant from the front street line, except that, in the case of uncertainty, the Director of the Division of Planning and Zoning shall determine the rear line.

LOT LINE, SIDE
Any lot boundary line not a front or rear line thereof.

LOT LINES
The lines bounding a lot as defined herein.

LOT OF RECORD
A lot or parcel of land, the plat or deed of which has been recorded in the office of the Recorder of Deeds of St. Charles County, Missouri, prior to the adoption of this ordinance.

LOT, THROUGH
An interior lot having frontage on two (2) streets. A through lot shall be deemed to have a front yard setback for each street.
LOT WIDTH
The horizontal distance between side lines, measured at the front building line.

LOWEST FLOOR
The lowest floor of the lowest enclosed area, including basement. An unfinished or flood-resistant enclosure, usable solely for parking of vehicles, building access, or storage, in an area other than a basement area, is not considered a building's lowest floor, provided that such enclosure is not built so as to render the structure in violation of the applicable floodproofing design requirements of this Chapter or Chapter 410.

MANUFACTURED HOME
A residential dwelling built after June 15, 1976, in accordance with the Federal Manufactured Home Construction and Safety Standards, which standards apply to homes to be constructed on a non-removable steel chassis.

MANUFACTURED/MOBILE HOME PARK SUBDIVISION, EXISTING
Any area, tract, or site of land zoned "RM", Mobile Home District, whereupon manufactured or mobile homes, as defined within the ordinance, are placed or located on individual lots, and intended to be used, let, leased, or rented, for dwelling purposes.

MANUFACTURED HOME SUBDIVISIONS
A subdivision designed and/or intended for the sale of all lots for sitting manufactured and/or modular structures.
MARINA
A dock or basin providing secure moorings for motorboats and yachts and often offering supply, repair and other facilities.

MARKET VALUE OR FAIR MARKET VALUE
An estimate of what is fair, economic, just, and equitable value under normal local market conditions.

MASSAGE PARLOR
A commercial establishment where, for any form of consideration, massage, alcohol rub, fomentation, electric or magnetic treatment, or similar treatment or manipulation of the human body is administered, unless such treatment or manipulation is administered by a medical practitioner, chiropractor, acupuncturist, physical therapist, or similar professional person licensed by the State. This definition does not include an athletic club, health club, school, gymnasium, reducing salon, spa, or similar establishment where massage or similar manipulation of the human body is offered as an incidental or accessory service.

MASTER PLAN
The long-range plan for the County intended to guide the future growth and development of the area. Includes analysis, recommendations, and goals and objectives for the community's population, economy, housing, transportation, community facilities, and land use.

MEAN SEA LEVEL
For purposes of the National Flood Insurance Program (NFIP), the National Geodetic Vertical
Datum (NGVD) of 1929, or other datum, to which base flood elevations shown on a community's Flood Insurance Rate Map (FIRM) are referenced.

MICROBREWERY
A restaurant that prepares handcrafted natural beer as an accessory use for consumption on the premises. Such accessory use may occupy up to thirty percent (30%) of the gross floor area of the restaurant.

MINING
The extraction of minerals including: solids such as coals and ores, liquids, such as crude petroleum, and gases, such as natural gases. The term also includes quarrying, milling, such as crushing, screening, washing and flotation; and other preparation customarily done at the mine site or as a part of mining activity.

MOBILE HOME
A residential dwelling unit that was fabricated in an off-site manufacturing facility, designed to be a permanent residence, built prior to enactment of the Federal Manufactured Home Construction and Safety Standards. Such structure has a chassis, axles and a hitch which are part of the structure and which may reasonably be equipped with wheels for transporting the structure from place to place. (Does not include recreational vehicles or travel trailers.)

MODULAR STRUCTURE
A factory fabricated building unit, exclusive of manufactured homes and mobile homes, designed to be incorporated with one (1) or more similar units at a building site into a modular structure to
be used for residential purposes. Such a modular unit is delivered with a seal issued by the Missouri Public Service Commission certifying the unit as a modular structure and also with a purchaser's certificate of compliance certifying that the unit as a modular structure has been constructed to applicable standards by the Missouri Public Service Commission for modular units.

**MONOPOLE**
A structure composed of a single spire used to support telecommunications equipment and antennas. Generally, constructed of steel and at heights typically ranging from twenty (25) to one hundred twenty-five (125) feet. The structure is usually circular in sections, with base diameters increasing with height and loads from about twenty-four (24) to about forty-eight (48) inches.

**Motel**
Any building or group of buildings containing guest rooms or dwelling units, some or all of which have a separate entrance leading directly from the outside of the building with garage or parking space located on the lot, and designed, used, or intended wholly or in part for the accommodation of automobile transients.

**NATIVE VEGETATION**
Plant life or total plant cover indigenous to the surrounding area.

**NATURAL WATERCOURSE**
A channel formed in the existing surface topography of the earth prior to changes made by unnatural conditions.
NEW CONSTRUCTION
   See CONSTRUCTION, NEW.
NEW MANUFACTURED HOME PARK OR SUBDIVISION
   See MANUFACTURED HOME SUBDIVISIONS.
NIGHTCLUB
   A commercial establishment dispensing alcoholic beverages for consumption on the premises and where a dance floor or entertainment is provided.
NON-CONFORMING USE
   The lawful use of land or a building, or a portion thereof, which use does not conform with the use regulations of the district in which it is located and which use existed at the time of the adoption of this ordinance.
NURSERY
   An enterprise that conducts the retail and/or wholesale sales of trees, shrubs, flowers and grasses grown on or off the premises for transplanting as well as accessory items. Accessory products for sale may include, but are not limited to, fertilizers, mulch, edging material, top soil. Services associated with the nursery include landscape design and installation of materials sold from the nursery.
NURSERY, DAY
   See DAYCARE CENTER.
NURSERY SCHOOL
   See PRESCHOOL.
NURSING HOME (CONVALESCENT CARE FACILITY)
Any premises which provides twenty-four (24) hour accommodation, board, personal care, and nursing care or skilled nursing care services under the daily supervision of a licensed nurse or registered professional nurse and under the direction of a licensed physician to the aged or infirmed; but not including hospitals, clinics, or similar institutions devoted primarily to the diagnosis and treatment of the sick or injured.

**OFF-PREMISE SIGN**
See BILLBOARD.

**ON-PREMISE SIGN**
See SIGN (ON-PREMISE).

**100-YEAR FLOOD**
The base flood having a one percent (1%) chance of annual occurrence.

**OPEN CHANNEL**
A constructed ditch or channel designed for water flow.

**OPEN SPACE**
Area within a development which can be graded, landscaped or left in its natural state and is intended to be maintained for active or passive recreational use. Such areas shall be grassed and landscaped or covered only for a recreational purpose. Roofs, driveways, parking areas, required landscaped areas and required setbacks shall not constitute open space.

**OPEN STORAGE**
Storage of material or goods on the ground outside a building.
OVERLAY DISTRICT
A district which acts in conjunction with the underlying zoning district or districts. The original underlying zoning district designation does not change.

PARCEL OF LAND
A separately designated area of land delineated by identifiable legally recorded boundary lines.

PARKING SPACE
A surfaced area, enclosed or unenclosed, sufficient in size to store one (1) automobile, and not less than nine (9) feet wide and nineteen (19) feet long, together with a parking aisle or driveway connecting the parking space with a street, road, or alley, and permitting ingress and egress for automobiles.

PASSENGER CAR
A motor vehicle designed for carrying ten (10) persons or less and used for the transportation of persons; except that, the term "passenger car" shall not include motorcycles, motorized bicycles, motor tricycles, ATV's, recreational vehicles and trucks that meet the definition of a commercial vehicle.

PERFORMANCE GUARANTEE
Escrow agreement, lender's agreement, certified check or standby letter of credit as required by Chapter 410 or 412 and authorized by ordinance to secure installation of improvements or erosion and sediment controls.

PERMEABILITY TEST
A test designed to determine the ability of ground to absorb water, and used to determine the
suitability of a soil for drainage or for the use of a septic system.

**PERSON**
An individual, proprietorship, partnership, corporation, association, or other legal entity.

**PERSONAL SERVICE ESTABLISHMENT**
An establishment which offers specialized goods or services purchased frequently by the consumer. Included are barbershops, beauty shops, massage facilities, chiropractic clinics, garment repair, laundry cleaning, pressing, dyeing, tailoring, shoe repair, and other similar establishments.

**PET**
A domesticated animal kept for pleasure rather than utility. Small animals including fish or fowl permitted in the house or yard and are customarily kept for personal use or enjoyment within the home. Shall include but not be limited to: dogs, cats, rabbits, small mammals, common aquarium animals, fish, domestic tropical birds (i.e. canaries, parrots, parakeets), rodents and animals which may be classified as "domestic other" (not defined as exotic or wild animals). The number of particular type of pet may be further regulated under Exhibit 1, Permitted Animal Regulations.

**PET, DOMESTIC OTHER**
An animal that may be considered appropriate as a pet which is not classified as an exotic or wild animal. The animal is kept for personal use and is customarily kept within the home. This classification may include such animals as potbellied pigs, ferrets, or other animals that may be
allowed as pets by the County Community Health and the Environment Director.

PLANNED DEVELOPMENT DISTRICT
A planned development district is a comprehensively planned development containing residential, commercial, industrial, and/or other land uses on an area of land in single, partnership, or corporate ownership, and under unified control.

PLANNED UNIT DEVELOPMENT (PUD)
A single parcel or contiguous parcels of land intended to be developed in accordance with an overall design plan (preliminary development plat), which may or may not have a mixture of land uses.

PLANNING AND ZONING COMMISSION
St. Charles County Planning and Zoning Commission.

PLAT
A map, plan, or layout of a subdivision indicating to scale the location and boundaries of individual properties.

PLAT, BOUNDARY ADJUSTMENT
A plat which depicts a change in a recorded subdivision that affects any lot line, provided that no new lot or illegal zoning lot is created.

PLAT, FINAL
A map of land subdivision prepared in form suitable for filing of record with necessary affidavits, dedications, and acceptances, and with complete bearings and dimensions of all lines defining lots and blocks, streets and alleys, public areas, and other dimensions of land.
PLAT, PRELIMINARY
   Preliminary engineering maps, drawings, or charts, and supportive material indicating the proposed layout of the subdivision.

PLAT, RESUBDIVISION
   A final plat which depicts a change in a recorded final subdivision plat that affects any street layout, easement of access, right-of-way, design concept, or creates a new lot, provided that no illegal zoning is created.

POLITICAL SIGN
   A sign identifying and urging voter support for a particular election issue, political party or candidate for public office.

PRESCHOOL
   A pre-kindergarten school for children, primarily between the ages of three (3) and five (5).

PUBLIC HEARING
   A meeting announced and advertised in advance and open to the public, with the public given an opportunity to talk and participate.

QUARRY
   A place where rock, ore, stone, and similar materials are excavated for sale or off-tract use.

RECREATION, COMMERCIAL OUTDOOR
   Predominantly participant recreational uses conducted in the open or partially enclosed facilities. Typical uses include swimming pools, tennis courts, racquetball courts, athletic fields, archery ranges and shooting ranges. Enclosed facilities providing accessory functions including concessions, locker rooms, restrooms and indoor space for those activities that are provided outdoors.
shall be permitted. The total area of the enclosed structures shall not exceed three percent (3%) of the total site area.

RECREATION, COMMERCIAL INDOOR
A commercial recreational use conducted entirely within a building, including arcade, arena, athletic clubs, fitness and health clubs, auditorium, bowling alley, gymnasium, billiard hall, skating rink, swimming pool, basketball, soccer, volleyball, racquetball, handball, tennis court.

RECREATIONAL EQUIPMENT
Any recreational vehicle, motorized off-road vehicle, any watercraft regardless of propulsion, or any trailer designed or customarily used to transport such off-road vehicle or watercraft. See also RECREATIONAL VEHICLE.

RECREATIONAL USES
Uses for the conduct of sports, leisure-time activities, and other customary and usual recreational activities.

RECREATIONAL VEHICLE
A vehicle which is:

1. Built on a single chassis;

2. Four hundred (400) square feet or less, when measured at the largest horizontal projection;

3. Designed to be self-propelled or towable by a vehicle; and

4. Designed primarily as temporary living quarters for recreational, camping, travel, or seasonal use, but not for use as a permanent dwelling.
RECYCLING CENTER
A facility at which recyclable and recoverable material already separated from the waste stream is deposited, collected, and prepared for shipment elsewhere. Treatment of the collected material is limited to that which is necessary to prepare it for shipment, such as dismantling, crushing, shredding, and compacting. No manufacturing or conversion of the material into another product is allowed at a recycling center.

RECYCLING COLLECTION FACILITY
A collection or drop-off facility designed to allow turn-in of recyclable or reusable materials. Such a facility may utilize outdoor collection receptacles, such as bins, boxes, cans, kiosks, and igloos, as well as collection vans and trailers. A recycling collection facility must be maintained free of litter, and all collected material must be secure from unauthorized removal. A recycling collection facility may not process or treat the collected material other than ordinary sorting, baling, and similar preparation for shipment elsewhere. The total area utilized by a recycling collection facility shall not exceed five hundred (500) square feet.

REGULATED SUBSTANCE
Any hazardous substances, extremely hazardous substances, or liquid petroleum products which are more particularly defined as follows:

1. *Extremely hazardous substance.* Any substance so designated by the U.S. Environmental Protection Agency on their official "List of Extremely Hazardous Substances", 40 CFR 355 Appendix A, as
last amended, and which is either a solid (including granular and gel) or liquid at room temperature.

2. *Hazardous substance.* Any substance so designated by the U.S. Environmental Protection Agency on their official "List of Hazardous Substances", 40 CFR 302.4, as last amended, and which is either a solid (including granular and gel) or liquid at room temperature.

3. *Liquid petroleum product.* Any flammable liquid hydrocarbon product refined from bituminous materials, including but not limited to gasoline, diesel fuel, benzene, toluene, lubricants for internal combustion engines, home heating oil, kerosene, creosote, coal oil, and naphtha.

**REGULATORY FLOOD ELEVATION**

Elevation indicated on the Flood Insurance Rate Map as the elevation of the 100-year flood.

**REGULATORY FLOOD PROTECTION ELEVATION**

An elevation one (1) foot above the regulatory flood elevation.

**RESIDENCE**

Any single or multi-family living space containing kitchen and bathroom facilities and which is used, or intended by design to be used, by one (1) or more persons as a place of occupancy.
RESIDENTIAL STRUCTURE, PRIMARY
The main residential structure on the property which has kitchen and bedroom facilities, not including any detached buildings.

RESOURCE RECOVERY FACILITY
A facility at which recyclable and recoverable material is separated and removed from the waste stream for reuse or remanufacture. Once removed from the waste stream, the material is processed for shipment elsewhere. Said processing may include shredding, crushing, baling, grinding, and compacting, as well as manufacturing or converting the material into another product.

RESTAURANT
An establishment where food and drink are prepared, served, and consumed by persons seated within the building (this includes cafes, cafeterias, ice cream parlors, and tea rooms).

RESTAURANT, FAST-FOOD
Restaurants where customers order and are served their food at a counter or in a motor vehicle in packages prepared to leave the premises, or able to be taken to a table or counter to be consumed.

RETENTION BASIN
A pond, lake or basin used for the permanent storage of water runoff without release except by means of evaporation, infiltration or emergency by-pass.

RIGHT-OF-WAY
A dedication of land to be used generally for streets, alleys, or other public uses, wherein the owner gives up owner's rights to the property as long as it is being used for the dedicated purpose.
Right-of-way is also a land measurement term meaning the distance between lot property lines which generally contains not only the street pavement, but also the sidewalks, grass area, underground utilities, and sometimes above ground utilities.

**RIVERBOAT GAMBLING VESSEL**
A boat or ferry, whether floating or permanently docked, licensed by the Missouri Gaming Commission, on which gambling activities are allowed.

**ROAD BED**
The entire improved portion of the street, including shoulders, parking lanes, travel ways, curbs, and gutters which lie between the right-of-way lines.

**RURAL RECREATIONAL ACTIVITY**
A permanent or seasonal commercial activity drawing clients or customers to a rural property either for such recreational purposes as picking produce for purchase (pick-your-own apple orchards or pumpkin farms, for example), visiting pumpkin patches or corn mazes or petting farms, taking sleigh or hay-wagon rides.

**SALVAGE YARD**
A parcel of land on which waste material, dismantled or inoperative vehicles, equipment, and other machinery is collected, stored, salvaged, or sold.

**SANITARY LANDFILL**
Land used or intended to be used, let, leased, rented, or sold for occupancy by the establishment of a landfilling method of disposing of garbage,
rubbish, and ashes on land without nuisance, fire, or public health hazard.

SEDIMENT
Solid material, mineral or organic, that has been moved by erosion and deposited in a location other than the point of origin.

SEMI-PUBLIC
A private non-profit organization open to some persons outside the regular constituency (i.e., American Legion and VFW).

SETBACK, FRONT
The distance between the street right-of-way line and the front line of a building or any projection thereof, excluding uncovered steps.

SETBACK LINE
The line parallel to the front, side, or rear lot line establishing the minimum space to be provided as the front, street, or shoreline of a lake or a river.

SETBACK, SIDE/REAR
The distance between the property line and the building or any projection thereof.

SEXUAL ENCOUNTER ESTABLISHMENT
A commercial establishment other than a hotel, motel, or similar establishment offering public accommodations which, for any form of consideration, provides a place where two (2) or more persons may congregate, associate, or consort in connection with specified sexual activities or the exposure of specified anatomical areas. This definition does not include an establishment where a medical practitioner, psychologist, psychiatrist, or similar professional person licensed by the State engages in sexual therapy.
SEXUALLY ORIENTED BUSINESS
An adult arcade, adult bookstore, adult novelty store, adult video store, adult cabaret, adult motel, adult motion picture theater, adult theater, escort agency, massage parlor or sexual encounter establishment.

SHRUBS
A low, woody plant, either evergreen or deciduous, with a mature height usually less than ten (10) feet, having several stems but no trunk.

SIGHT TRIANGLE
A triangular-shaped portion of land established at street intersections in which nothing is erected, placed, planted, or allowed to grow in such a manner as to limit or obstruct the sight distance of motorists entering or leaving the intersection.

SIGN (OFF-PREMISE)
See BILLBOARD.

SIGN (ON-PREMISE)
Any words, numerals, figures, devices, designs, or trademarks by which information is made known concerning the existence of a commercial enterprise, service, or other activity conducted, sold, or offered on the premises on which the sign is erected.

SITE
A lot or parcel of land, or a contiguous combination thereof, where grading work is performed as a single unified operation.

SITE DEVELOPMENT
Altering terrain and/or vegetation and constructing improvements.
SITE PLAN
A drawing or plan illustrating a proposed development and prepared in accordance with the regulations outlined in the various Sections of the ordinance, with special reference to Part 4, Section 405.525, Site Plan Review.

SKEET/TRAP SHOOTING CLUB
A facility for the shooting of clay pigeons. The clay targets are sprung from a trap away from the shooter, or are thrown in such a way as to simulate the angles of the flight of birds.

SMALL TREES/LARGE SHRUBS
Deciduous trees or shrubs with a mature height of ten (10) to thirty (30) feet.

SPECIFIED ANATOMICAL AREAS
Any of the following:

1. Bare human male or female genitals, buttocks, anus or pubic area with less than full opaque clothing covering;

2. The female breast below a horizontal line across the top of the areola, or a simulation thereof, at its highest point with less than fully opaque clothing covering. This definition shall include the entire lower portion of the human female breast, but shall not include any portion of the cleavage of the human female breast, exhibited by a dress, blouse, shirt, leotard, bathing or swimsuit, or other wearing apparel, provided the areola is not exposed in whole or in part; or
3. The covered male genitals in a discernibly turgid state.

SPECIFIED SEXUAL ACTIVITIES
Any of the following:

1. The fondling or other erotic touching of human genitals, pubic region, buttocks, anus, or female breasts;

2. Sex acts, normal or perverted, actual or simulated, including intercourse, oral copulation, masturbation, or sodomy; or

3. Excretory functions as part of or in connection with any the activities set forth in (1) through (2) above.

STABLE, BOARDING
A structure designed for the feeding, housing and exercising of horses not owned by the owner of the premises where the owners of the horses on the property train the horses and the horses are not utilized for remuneration or hire.

STABLE, PRIVATE
An accessory building for the keeping of horses, ponies, or mules owned by occupants of the premises, and not kept for remuneration, hire, or sale.

STABLE, RIDING
A facility used principally for pleasure riding, polo or driving of horses and ponies which may also include uses such as shows in riding arenas and the training, hire or sale of horses or ponies as additional uses to the principal use of the facility.

START OF CONSTRUCTION
See CONSTRUCTION, START OF.
STEALTH TELECOMMUNICATION TOWER
Any telecommunication tower that is integrated as an architectural feature of a structure so that the purpose of supporting antennas is not readily apparent to a casual observer.

STORM WATER MANAGEMENT FACILITY
A facility designed and installed to intercept, detain, retain, infiltrate, evaporate, transpire, filter, and/or convey surface storm water runoff, including but not limited to such facilities as detention basins, storm water harvesting facilities, rain gardens, bio-swales, bio-retention basins, engineered wetlands, sand and other proprietary filter systems, pervious pavement, etc., for the purposes of removing pollutants, reducing or controlling storm water volume and rate, maintaining pre-development hydrology, and/or flood control.

STREAM BANK, TOP OF EXISTING
The top of the natural incline bordering a natural watercourse.

STREET
A thoroughfare which affords principal means of access to property abutting thereon, and including all State and County highways.

STREET, COLLECTOR
Collector streets interconnect the major arterial system with local streets; provide internal circulation within residential, commercial, and industrial areas; provide access to abutting properties; and have a moderate volume and design capacity and travel speeds.
STREET, CUL-DE-SAC
A short, minor, local street, having only one (1) end for vehicular traffic, and the other permanently terminated by a turnaround for vehicles.

STREET, MINOR
Minor streets provide access to abutting properties, have relatively short travel distance, and have a low-volume design capacity and travel speeds.

STREET RIGHT-OF-WAY LINE
The line separating a lot, tract, or parcel of land from the contiguous right-of-way of a street.

STRUCTURAL ALTERATIONS
Any change which would prolong the life of the supporting member of a building or structure, such as bearing walls, columns, beams, or girder, not including openings in bearing walls permitted by other ordinances.

STRUCTURE
Anything erected, reconstructed, altered, repaired, relocated, or portable, the use of which requires a location on a parcel of land. It includes a movable structure: it is located on land which can be used for housing, business, commercial, industrial, agricultural, or office purposes, either temporarily or permanently.

SUBDIVIDER
Any person, firm, partnership, association, corporation, estate, trust, or any other group or combination acting as a unit, dividing or proposing to divide land so as to constitute a subdivision as defined herein.
SUBDIVISION

Shall, for the purpose of these regulations, be the division of a tract of land:

1. Into three (3) or more lots, tracts, sites or parcels, where each of which are less than ten (10) acres in area, providing that no illegal zoning lot is created; or

2. The division of a tract of land into any number of lots, tracts, sites or parcels of any size in which a public street is to be dedicated, reserved, platted, opened, or constructed, or the dedication or platting, or recording of any streets; or

3. The division of a tract of land into three (3) or more lots, tracts, sites or parcels which front on and utilize an easement of access.

SUBSTANTIAL DAMAGE

Damage of any origin sustained by a structure, whereby the cost of restoring the structure to its before-damaged condition would equal or exceed fifty percent (50%) of the market value of the structure before the damage occurred.

SUBSTANTIAL ENLARGEMENT OF SEXUALLY ORIENTED BUSINESS

An increase in floor areas occupied by the business by more than twenty-five percent (25%), as the floor areas exist on the date this Article takes effect.
SUBSTANTIAL IMPROVEMENT

Any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds fifty percent (50%) of the market value of the structure before "start of construction" of the improvement. This term includes structures which have incurred "substantial damage" regardless of the actual repair work performed. The term does not, however, include either:

1. Any project for improvement of a structure to correct existing violations of State or local health, sanitary, or safety code specifications that have been identified by the local Code Enforcement Official and which are the minimum necessary to assure safe living conditions, or

2. Any alteration of a "historic structure", provided that the alteration will not preclude the structure's continued designation as a "historic structure", or

3. An improvement that does not require a building permit under applicable codes enacted in Title V, Ordinances of St. Charles County, Missouri.

TATTOOING

Any method of placing ink or other pigment into or under the skin or mucosa by the use of needles or any other instruments used to puncture the skin, resulting in permanent coloration of the skin or mucosa. This includes all forms of cosmetic tattooing.
TATTOOING AND BODY PIERCING
The practice of physical body adornment by any method including, but not limited to, the following: body piercing, tattooing, cosmetic tattooing, branding and scarification. This definition does not include practices that are considered medical procedures by a State Medical Board, such as implants under the skin. This definition also does not include ear piercing as fully defined in Section 645.080(B).

TATTOOING AND BODY PIERCING ESTABLISHMENT
Any place of business which performs tattooing and body piercing.

TELECOMMUNICATION FACILITY
An unmanned facility consisting of equipment buildings, shelters or cabinets, accessory equipment, and an existing or new structure or tower to support antennas used for the reception, switching, and/or transmission of wireless communications, including, but not limited to, paging, enhanced specialized mobile radio (ESMR), Personal Communications Services (PCS), domestic public cellular radio telecommunications service (Traditional Cellular), and similar technologies.

TELECOMMUNICATION TOWER
A lattice-type, guyed or monopole structure that supports one (1) or more antennas.

TELECOMMUNICATION TOWER FARM
The placement of more than one (1) telecommunication tower on a lot.
TOWNHOUSE
A one (1) family dwelling in a row of at least three (3) such units in which each unit has its own front and rear access to the outside, no unit is located over another unit, and each unit is separated from any other unit by one (1) or more common fire-resistant walls.

TRAILERS
A vehicle standing on wheels, towed or hauled by another vehicle and used for carrying materials, goods or objects.

TRANSFER OF OWNERSHIP OR CONTROL OF A SEXUALLY ORIENTED BUSINESS
Any of the following:

1. The sale, lease, or sublease of the business;
2. The transfer of securities which constitute a controlling interest in the business, whether by sale, exchange, or similar means; or
3. The establishment of a trust, gift, or other similar legal device which transfers the ownership or control of the business, except for transfer by bequest or other operation of law upon the death of the person possessing the ownership or control.

TRASH TRANSFER STATION
A facility at which municipal solid waste is unloaded from small collection vehicles and loaded onto a larger means of transport for hauling. A trash transfer station may or may not be operated in conjunction with a resource recovery facility.
TRAVEL TRAILERS
A vehicular portable structure designed as a temporary dwelling for travel, recreational, and vacation uses.

TRAVEL TRAILER PARK
A parcel of land under a single ownership that has been planned and improved for the placement of travel trailers and recreational vehicles.

TREE CANOPY
The area in square feet of a tree's spread. Existing tree canopy is determined by measuring the ground's surface area that is covered by the branch spread of a single tree. Ultimate tree canopy is determined by assigning the following values for planted trees: one thousand (1,000) square feet for a large deciduous tree, seven hundred (700) square feet for each medium deciduous tree or conifer and three hundred (300) square feet for each small flowering tree.

TREE PROTECTION AREA
All land within the canopy drip line of a tree.

TWINHOME
See DWELLING, TWO-FAMILY.

VARIANCE
Relief from or variation of the provisions of these regulations, other than use regulations, and as applied to a specific piece of property, as distinct from rezoning, as further set out hereinafter within Part 7 of this Chapter 405, Sections 405.590 et seq. Also, a grant of relief by the community from the terms of a floodplain management regulation. Flood insurance requirements remain in place for
any varied use or structure and cannot be varied by the community.

VEGETATED BUFFER
Area of plant life or total plant cover established adjacent to and in order to protect a natural watercourse.

VEHICLE IMPOUND FACILITY
A parcel of land or a building that is used for the temporary storage of wrecked motor vehicles or vehicles towed due to a law enforcement directive. Vehicles stored at the facility are to be claimed by title holders or their agent. No vehicle shall remain on the property for a period to exceed ninety (90) days.

VILLA
Typically an attached row of houses. Two (2) or more single-family dwellings sharing common wall areas, each on its own individual lot with a front and rear yard.

VIOLATION
The failure of a structure or other development to be fully complaint with the community's floodplain management regulations. A structure or other development without the elevation certificate, other certifications, or other evidence of compliance required by this Chapter or Chapter 410 is presumed to be in violation until such time as that documentation is provided.

WAREHOUSE
A structure for use as a storage place for goods, materials, or merchandise.
WAREHOUSE, MINI
A building containing individual storage areas which may be rented or leased for a period of time.

WIND TURBINE
Any mechanism or device designed for the purpose of converting wind energy into electrical or mechanical power.

WIND TURBINE FARM
The use of more than one (1) wind turbine on a parcel that converts wind energy into electrical power for the primary purpose of resale.

WINERY
Any establishment that makes more than two hundred (200) gallons of wine annually, including grape crushing, fermenting, and bottling, with or without subsidiary accessory uses, including, but not limited to, the sale of wine and related products, public wine tasting, sale and service of food, and tours of the winery. Any such establishment shall have five (5) acres or more of wine grapes cultivated on the premises. All wine produced at the winery must be produced under a State of Missouri domestic winery license. At least fifty percent (50%) of the grapes used in the wine produced on site must be grown within St. Charles County.

WINERY FARMERS' MARKET
A facility accessory to and on the same tract of land as a duly permitted and functioning winery that is for the weekly sale by multiple vendors of produce and that may also be for the weekly sale by multiple vendors of other food and craft products.
or for instruction or demonstration of cooking or farming skills.

WINERY LODGING
A hotel or motel that is accessory to and on the same tract of land as a duly permitted and functioning winery, that has no more than three (3) sleeping rooms for each five (5) acres of that tract of land, and that does not include a food establishment as defined and regulated by the St. Charles County Food Code, Chapter 230, Ordinances of St. Charles County, Missouri.

WOODLAND
Any tree canopy over five thousand (5,000) square feet having at least thirty percent (30%) of the trees with a caliper of at least two and one-half (2½) inches.

WOODLAND CANOPY
Ultimate woodland tree canopy is determined by assigning two hundred (200) square feet for each tree within a designated woodland.

YARD
An open space, other than a court on a lot, unoccupied and unobstructed from the ground upward, except as otherwise provided in this Chapter or Chapter 410.

YARD, FRONT
A yard across the full width of the lot extending from the front line of the main building to the front line of the lot.

YARD, REAR
A yard between the rear lot line and the rear line of the main building and the side lot lines.
YARD, REQUIRED FRONT
A yard across the full width of the lot extending from the minimum front yard setback distance to the front line of the lot.

YARD, SIDE
A yard between the main building and the adjacent side line of the lot, and extending entirely from a front yard to the rear yard.

ZONING DISTRICT MAP
A series of maps of unincorporated St. Charles County with all notations, dimensions, references, and symbols shown thereon depicting the individual zoning districts in accordance with Section 405.065

Section 3.  Section 405.525, OSCCMo. is hereby amended as follows (additions and updated information in bold type and deletions [bracketed and stricken]):

Section 405.525 Site Plan Review.

A. For the purpose of assuring compliance with the requirements of the applicable regulations, site plans shall be submitted and reviewed in accordance with the requirements of this Section.

B. Before any building and land use permits can be issued for the new construction of or the addition to institutional, commercial, and industrial structures, a site plan must be furnished to the County Division of Planning and Zoning for review and approval by the Director of the Division of Planning and Zoning, the Director of the Division of Development Review, and, when
publicly maintained streets or storm sewers are involved, the County Engineer. A site plan will also be required when a structure is converted in use to an institutional, commercial, or industrial. Also, a site plan may be required by the Division of Planning and Zoning when the use of a site is being changed. The site plan in these cases will ensure that regulations are adhered to, based upon the new use (parking, loading, etc.). All site plans must bear the seal of a registered professional engineer and/or architect licensed by the State of Missouri, unless waived by the Director of Community Development.

C. *Filing A Site Plan.* When a site plan is first submitted, the Division of Planning and Zoning requires a digital plan or three (3) copies of the plan and a completed site plan application form. For the purpose of investigating a site plan and monitoring compliance with it, an applicant authorizes the Community Development Department's staff, or staff of other agencies at the Department's direction, to enter and inspect the subject property while work authorized by that permit is in progress. This authority shall cease upon completion of that work and closure of the permit.

D. Requirements for site plans are as follows:
1. Provide a title (always use the term "site plan").
2. Indicate the owner(s) of the property and depict the adjacent property owners.
3. Provide a site location map, a north arrow, and the scale to which the site plan is drawn.
4. Indicate the dimensions of all proposed buildings and depict all property boundary lines.

5. Indicate every type of business that will utilize the building(s) and/or site(s).

6. Indicate any existing and proposed road/street right-of-way lines and existing or proposed pavement within such right-of-way (note on the plan that all pavement within the road/street right-of-way will be constructed to St. Charles County public non-residential or arterial standards). Dedicated rights-of-way may be required for proposed sites that abut County roads or roads maintained by the Missouri Department of Transportation (MoDOT).

7. Indicate the front setback of all proposed buildings.

8. Indicate the pavement radii and width of all proposed entrances to or from the site(s).

9. Indicate the parking layout arrangement (i.e., the number and size of all off-street parking spaces and the width of all parking drives and aisles). Each parking space must have a minimum area of one hundred seventy-one (171) square feet (nine (9) feet by nineteen (19) feet). There shall also be provisions for handicapped parking, with each handicapped parking space having a minimum width of thirteen (13) feet (eight (8) foot stall with an adjoining five (5) foot access aisle, per ADA regulations). The parking surface must be constructed of an all-weather, dust-free
surface. If five (5) or more parking spaces are required under the applied regulations, the parking spaces must be paved and striped. See Part 3, Article II, Section 405.440 et seq., for further parking and loading requirements.

10. Indicate existing and proposed contour elevation lines at an interval no greater than five (5) feet and the first (1st) floor elevation of each building on U.S.G.S. datum. If the site is in the 100-year floodplain, the requirements of Part 2, Article XI, Section 405.245 et seq. must be adhered to.

11. Indicate a benchmark on U.S.G.S. Datum in areas where sanitary sewers are available.

12. Depict existing and proposed stormwater improvements and provide hydraulic data computations along with a drainage area map. This material must be sealed by a registered professional engineer, unless waived by the Director of Community Development.

a. The hydraulic design of storm sewer systems shall conform to Section 50.00 of St. Charles County's "Design Criteria for the Preparation of Improvement Plans" as issued by the St. Charles County Highway Department in February 2002, or as amended thereafter.

b. [Stormwater detention] Post-construction stormwater
management shall be required in accordance with Section 50.80 of St. Charles County's Design Criteria for the Preparation of Improvement Plans ["Design Criteria for the Preparation of Improvement Plans" as issued by the St. Charles County Highway Department in February 2002, or as amended thereafter].

c. Costs for all stormwater management facility improvements shall be included and released as part of the Performance Guarantee required under Section 412.080 of the Unified Development Ordinance and [Performance guarantees, ensuring or guaranteeing the installation of any detention facilities required for the site,] must be posted with the St. Charles County Department of Community Development before site plan approval will be granted. [The detention facilities' improvement costs must be included as part of the sediment and erosion control performance guarantee required by Chapter 412.]

d. Prior to the issuance of the letter closing the land disturbance permit and releasing the performance guarantee required under Section 412.080 of the Unified Development
Ordinance, the property owner(s) of any stormwater management facility shall:

(1) Execute a Development Restrictions and Maintenance Agreement to ensure that the facilities are preserved, maintained, and kept in working order to the satisfaction of the County and per Section 420.020 of the Unified Development Ordinance. An exhibit or legal description of the restricted area(s) and a maintenance plan and schedule shall be developed by the property owner(s) or developer(s), approved by the Director of the Division of Development Review, and made a part of the Development Restrictions and Maintenance Agreement. The agreement shall also provide for access to the property occupied by any stormwater management facilities to St. Charles County or its successors for the purpose of inspection and enforcement of all applicable regulations of such stormwater management
facilities. The agreement shall be recorded and the cost of recording the document shall be paid by or recovered from the owner or developer of the site of the stormwater management facilities.

(2) Submit one (1) digital AutoCAD drawing file and one (1) digital file in “.pdf” format of "as-built" plans for all required stormwater management facilities. Stormwater management facilities shall be surveyed after the completion of construction to verify the elevations, dimensions, and locations of the facilities in relation to the approved design. Each set of "as-built" plans shall be certified and sealed by a professional engineer or land surveyor licensed in the State of Missouri.

e. Stormwater management facilities shall be maintained by the owner(s) of the property. Periodic maintenance shall be required of the facility owner(s) per the approved maintenance plan for the
development and Section 420.020 of the Unified Development Ordinance. No modifications shall be made to the facilities without approval from the Department of Community Development.

13. Indicate the method of or agencies responsible for sanitary sewage disposal and water service. Individual private sewage disposal systems will need to supply a plan, with the layout of the lateral system for the property, and a permeability test report as required by the County Division of Building and Code Enforcement.

14. Supply a Missouri Department of Transportation permit if any proposed entrances front on Missouri Department of Transportation-maintained road right-of-ways.

15. Indicate the zoning district for the site and the adjacent properties with their current jurisdiction.

16. A St. Charles County Highway Department special use permit must be obtained before any work is allowed to commence on the right-of-way of public roads under St. Charles County control or maintenance.

17. Indicate the location of the nearest fire hydrant on the site plan.
18. Depict on the plan the location of any ground sign. All ground signs must be a minimum of ten (10) feet from all property lines and a minimum of fifty (50) feet from the pavement of any intersection.

19. Obtain a land disturbance permit in accordance with Chapter 412 of the Unified Development Ordinance. In cases where the land disturbance is less than five thousand (5,000) square feet, indicate any sediment and erosion control measures needed for the site.

20. A parcel identification number should be noted on the site plan.

21. All applicable development shall meet the landscaping requirements embodied in Section 405.435 of the Unified Development Ordinance. Site plans for facilities for utilities (substations, water towers, microwave towers, sewage treatment plants, etc.) shall conform to landscaping requirements developed during planning staff review, and approved by the Director of the Division of Planning and Zoning.

22. Trash enclosures shall be screened on at least three (3) sides by a six (6) foot solid fence and on the fourth (4th) side by a solid gate, said fence and gate shall be constructed of
cedar, redwood, masonry or other compatible building material.

23. All site plans shall clearly show the boundaries of any setback from natural watercourses that are left in their natural state on the subject property and provide a note to reference the setback area stating: "There shall be no clearing, grading, construction or disturbance of vegetation except as permitted by Section 405.5026 of the Unified Development Ordinance of St. Charles County."

24. All site plans shall clearly show the locations of all utilities (including pipelines) and easements of record for them, and with respect to high pressure pipelines shall designate all setbacks and restrictions imposed by Section 405.503, Regulations Concerning High Pressure Pipelines.

25. Submit a letter addressed to St. Charles County by the holder of any such easement, if it is for the purpose of accommodating one (1) or more high pressure pipeline(s), certifying the accuracy of its easement and the location of the utility's facility as depicted on the proposed site plan, and also certifying that the proposed development will not impair the utility's easement rights or compromise its facility. If such a letter cannot be supplied, submit a letter or affidavit
stating the date on which a copy of the site plan was mailed or delivered (as the case may be) to the easement holder or its representative, and stating the name and address of that easement holder or its representative.

26. Provide any additional information on the site plan as deemed necessary by the Director of the Division of Planning and Zoning, Director of the Division of Development Review and/or the County Engineer (i.e., traffic study).

27. In approving site plans for public agencies, the Director of the Planning and Zoning Division shall have the power to approve minor variances to setbacks and parking requirements through his or her signature on the site plan.

E. A site plan review fee as set by ordinance shall accompany a site plan submitted for review pursuant to this Section.

F. *Construction Of Improvements Shown On Approved Site Plan.* If the owner or developer of property subject to an approved site plan begins construction of the improvements shown on it within eighteen (18) months of the site plan's approval, those improvements may be built in accordance with ordinances in force on the date of the site plan's approval. But if construction of those improvements begins later, those improvements
must be built in accordance with ordinances in force when construction starts. If, in such cases, newly enacted or amended ordinances require changes in site design, the Director of the Division of Planning and Zoning shall require submission of a revised site plan for the Division's review and approval as provided in this Section.

G. Installation Of Improvements. All improvements required on a site plan approved pursuant to Section 405.525 of the Unified Development Ordinance must be completed prior to occupancy of the structure or the change of use on the site.

Section 4. Section 410.110, OSCCMo. is hereby amended as follows (additions and updated information in bold type and deletions [bracketed and stricken]):

Section 410.110 Preliminary Plat Requirements.
A. Fifteen (15) folded prints of the preliminary plat, a reduced copy of the plat sheet measuring eight and one-half (8.5) inches by eleven (11) inches or eleven (11) inches by seventeen (17) inches and a digital version shall be submitted to the Division of Planning and Zoning at least twenty-seven (27) days before the meeting at which approval is requested. All preliminary plats shall be prepared by a Missouri registered professional land surveyor and/or Missouri registered professional engineer and bear their signature and seal. At the discretion of the Director of the Division of Planning and Zoning, an aerial photo of suitable scale and vintage may be required. The photo shall have superimposed upon it the boundary of the property
in question and any other information as may be deemed necessary by the Director of the Division of Planning and Zoning. Prior to submittal of a preliminary plat, the applicant may submit to the planning staff a concept plan for initial review. For the purpose of investigating a preliminary plat an applicant authorizes the Community Development Department's staff, or staff of other agencies at the Department's direction, to enter and inspect the subject property while the plat is in the approval process. This authority shall cease upon completion of the plat review.

B. Notification. After receiving a preliminary plat, the Division of Planning and Zoning will give notice by U.S. mail to the adjacent property owners. Notice shall be given to the adjacent property owners at least fifteen (15) days prior to the Planning and Zoning Commission meeting that the preliminary plat will be presented.

C. Preliminary Plat Information. Preliminary plats shall include, at minimum, the following unless waived by the Director of Planning and Zoning:

1. Identification.
   a. Proposed name of the subdivision.
   b. Names, addresses, and telephone numbers of owners, developers, and the engineers, as well as the surveyors responsible for preparation.
   c. North point, a scale of one (1) inch equals two hundred (200) feet or larger, and date.
d. Approximate acreage in tract to one-tenth (1/10) of an acre.

e. Location or key map.

f. A statement to the effect that "this plat is not for record" shall be stamped or printed on all copies of the preliminary plat.

2. **Plat Information.**

   a. Location of boundary lines and their relation to established section lines, fractional section lines or U.S. survey lines.

   b. Physical features of property, including watercourses, ravines, ponds (standing water), existing and proposed bodies of water, levees or drainage area, forested areas (every effort must be made to preserve as many existing trees as possible), outcropping of rock, bridges, culverts, present structures, existing sidewalks, pipelines, overhead electric lines and off-street parking, if applicable, as well as all easements of record for pipelines, overhead electric lines and other utilities. Watercourses left in their natural state must be shown within common ground, with lot lines set back from the top of the existing stream bank, or from the 10-year, 24 hour or 15-year, 20 minute water surface elevation, where no established top-of-bank can be determined, for all
subdivisions except those with lots three (3) acres or larger in size, as provided by Part 3, Article VI of Chapter 405 of this Unified Development Ordinance. All plats shall clearly show the boundaries of any setback from natural watercourses on the subject property which are left in their natural state and provide a note to reference that setback area stating: "There shall be no clearing, grading, construction or disturbance of vegetation except as permitted by Section 405.5026 of the Unified Development Ordinance of St. Charles County, Missouri".

c. Indicate average lot size for the development.

d. Topography of tract with contour interval of one (1), two (2), or five (5) feet on U.S.G.S. Datum.

e. Names of adjacent subdivisions, including existing lot numbers and/or property lines and owners, around perimeter within one hundred (100) feet, showing existing streets, highways, etc.

f. Location, width, and names of existing and proposed streets with right-of-way, pavements, roads, lot dimensions, sidewalks, setback lines, easements, parks, school sites, and other features of the proposed subdivision.
g. Cul-de-sac islands and raised medians shall be included within right-of-way if that right-of-way is dedicated by plat to the public and if improvements within that right-of-way are to be maintained by the public, as provided in Section 410.210(C), below.

h. Indicate the street dedication public or private.

i. All approximate gradients of streets will be shown.

j. Indicate the centerline curve radius on streets.

k. Depict a standard County entrance configuration at the entrance(s) to the development.

l. Depict any dedication strips along existing roadways.

m. Designation of land use, whether for residential, commercial, industrial, or public use, and present zoning district.

n. Designation of utilities to serve proposed subdivision.

o. Designation of the school and fire district which serves the proposed subdivision.

p. Location of [dry and/or wet detention areas] \textbf{stormwater management facilities} for stormwater runoff in common ground, with permanent feasible access provided for maintenance of same. The plat shall also dedicate to St. Charles County or
its successors in interest an easement of access to and in the common ground occupied by any [detention areas] stormwater management facilities for the purpose of inspection and enforcement of all applicable regulations of such [detention areas] stormwater management facilities. Placement and preservation of facilities outside of common ground will be considered on a case-by-case basis and approved by the Director of Community Development. Justification must be provided for consideration.

q. Common ground acreage to nearest one-tenth (1/10) of an acre and designation of common ground.

r. Depict floodway fringe, density floodway, and floodway boundaries, and provide base flood elevations as shown on Flood Insurance Rate Maps (FIRMS) issued by the Federal Emergency Management Agency (FEMA) and the maps presently filed in the office of the Division of Planning and Zoning. Any floodway areas or wetlands must be shown as common ground.

s. Provide proposed development stormwater runoff factor.

t. Other information, as may be required by the Director of the Division of
Planning and Zoning, to serve the intent and purpose of this Chapter.

u. Depict the location of water lines for subdivisions with individual water treatment systems.

v. Note on plat that all stub streets will likely be extended in the future development.

Section 5. Section 410.145, OSCCMo. is hereby amended as follows (additions and updated information in **bold** type and deletions [bracketed and stricken]):

Section 410.145 Tree Preservation Program for St. Charles County.

A. **Intent/Purpose.** The purpose of this Section is to promote the public health, safety, comfort and general welfare of St. Charles County residents by providing tree preservation standards. These standards are designed to enhance the quality and appearance of developed properties, protect existing natural resources, buffer differing land uses and conserve the value of land and buildings throughout St. Charles County. These standards will also increase energy efficiency through shading and cooling, **filter and assist in the management of stormwater runoff**, buffer noise and wind and provide wildlife habitat as well as pleasant visual relief.
B. Applicability. These standards will apply to all new residential developments in unincorporated St. Charles County except the following:

1. Individual single-family residences, not in a proposed and/or existing subdivision;
2. Individual two-family residences, not in a proposed and/or existing subdivision;

C. Plan Requirements.

1. All preliminary residential subdivision plats shall delineate the anticipated tree preservation plan. Tree preservation information supplied on the Preliminary Plat shall be as follows:

   a. The approximate limit of all tree preservation areas.
   b. Approximate areas where trees are to be removed.
   c. Estimated acreage calculations for the preservation areas.
   d. Aerial photo showing the area of trees as they existed three (3) years prior to submittal.
2. Final Tree Preservation Plan shall be included with the grading plans for a site and have the following:

a. Property boundary including north arrow and scale.
b. The proposed layout of all lots and public and private right-of-ways.
c. Existing and proposed topographic data for the site.
d. The location of all known existing utility easements.
e. The limits of all tree preservation areas to the edge of the canopy drip line.
   [f. A statement of intent by the property owner that all the County's tree preservation regulations shall be met within the required time frame and all material to be planted will be of sufficient size, condition and quality and maintained to meet the intent of the County's tree preservation regulations.]

3. The tree preservation limits as approved on the final tree preservation plan shall be depicted on the final plat. A note shall also be provided to reference any tree preservation areas stating: "There shall be no clearing, grading, filling, construction activities or disturbance in any tree preservation areas".

D. Tree Preservation Requirements.
1. Subject to paragraph (2), below, all developments shall meet a minimum tree preservation requirement of ten percent (10%) of the site or twenty-five percent (25%) of existing woodlands and trees as they existed three (3) years prior to submittal of the Preliminary Plat; whichever is greater. If the total area of trees on the site is equal to or less than ten percent (10%) of the total site area, fifty percent (50%) of the existing trees shall be retained. The preservation of existing trees must be depicted on the tree preservation plan. Existing woodlands and trees may be determined by using aerial photographs or field inventory. No credit will be given to a tree or any portion of a tree canopy that is not located on the subject property.

2. The Director of Community Development may waive all or part of the requirements imposed by paragraph 1, above, provided that:

   a. The Director or his designee, based on his physical inspection of the property to be developed, determines that strict compliance with those requirements would render the property undevelopable[3].
b. [The requirements for the replacement of destroyed trees imposed by Subsection (G) of this Section shall be met.] A replacement ratio of three (3) trees to each tree destroyed, damaged or removed is required to be planted in the development per the requirements of Subsections G and H. The final ten percent (10%) of the performance guarantee of the required erosion control plan will be held until all tree preservation requirements have been met.

E. **Protective Methods.** To receive preservation credit, trees to be preserved must be protected from direct and indirect root damage and trunk and crown disturbance. No credit will be allowed for any dead tree, any tree in poor health or any tree subjected to grade alterations. The death of any tree used for preservation credit shall require the owner to replace the tree. The following standards shall apply:

1. The protection area around trees shall include all land within the canopy drip line. This area shall remain free of all grading and filling activities.

2. Construction site activities such as parking, material storage, soil stock piling and
concrete washout shall not be permitted within tree protection areas.

3. Tree protection areas should be clearly identified prior to any land disturbance. Methods that may be used include snow fence, polyethylene, chain link fence, or construction stakes placed every fifteen (15) feet, or other measure as approved in writing by the Director of the Division of Development Review.

4. Signs shall be used to designate tree protection areas. Signs are to be posted visibly on all sides of the preservation area and must be visible throughout the development process. Minimum size for the signs is twenty-four (24) inches by thirty-six (36) inches and should state the following "TREE PROTECTION AREA—Machinery access, dumping or storage of materials and equipment is prohibited."

F. *Enforcement and Penalties*. The Director of the Division of Planning and Zoning is hereby charged with the responsibility of administering and enforcing the provisions of the landscaping and tree preservation program. All violations are subject to penalties set forth in Sections 405.640 through 405.655, except that the Director of the Division of Planning and Zoning shall have the
discretion to allow more than ten (10) days for the correction of violations, taking into account such factors as:

1. The requirements of the grading project under review, and

2. The requirements for planting or transplanting trees and shrubs under the best practices of the landscaping or arborist profession. If required tree protection areas are disturbed during construction, a replacement ratio of three (3) trees to each tree destroyed, damaged or removed is required to be planted in the development. The final ten percent (10%) of the performance guarantee of the required erosion control plan will be held until all tree preservation requirements have been met.

G. **Materials.** A mixture of native, hardy deciduous, flowering and/or coniferous trees may be planted.

1. All deciduous trees planted to meet the requirements of this Section must be a minimum caliper of two and one-half (2½) inches at the time of installation.
2. All coniferous trees must be a minimum of six (6) feet in height at the time of installation.

H. *Installation and Maintenance.* All landscape materials must meet the following:

1. All trees must be in place and healthy prior to the issuance of any occupancy permit. Upon approval by the Director of the Division of Planning and Zoning, a temporary certificate may be issued without the installation, provided written assurances are given that the planting will take place when the proper season arrives.

2. New landscaping shall not be planted within any easement, right-of-way or sight triangle.

3. All trees shall have natural bark mulch placed around the base of the tree, at least four (4) inches deep and have at least an eighteen (18) inch radius from the trunk.

4. Newly planted trees shall be supported (staked and tied) through the first (1st) growing season to insure proper growth.

5. All landscaping within common ground areas must be maintained by the owner. The landscaping must be maintained in a healthy
growing condition as is appropriate for the season of the year. Plant materials, which exhibit damage, must be restored to healthy condition or replaced within the next growing season.

Section 6. Section 410.160, OSCCMo. is hereby amended as follows (additions and updated information in bold type and deletions [bracketed and stricken]):

Section 410.160 Improvement Plans and Installation.

A. After the preliminary plat is approved, improvement plans for all or any part of the subdivision shall be prepared by an engineer and submitted to the Director of the Division of Development Review for review and approval by the Director. If any changes are made to the streets, storm or sanitary sewers, [detention] stormwater management facilities, drainage areas, or any other significant changes after the improvement plans have been approved or the date the final plat was recorded, then revised plans must be submitted to the Director of the Division of Development Review for reapproval by the Director. All submittals of improvement plans and design calculations must bear the seal of the engineer.

B. Improvement plans shall be prepared in accordance with St. Charles County's Design Criteria for the Preparation of Improvement Plans ["Design Criteria for the Preparation of Improvement Plans"]
as issued by the St. Charles County Highway Department in February, 2002, or as amended thereafter].


D. Actual construction of such facilities and improvements may commence at the developer's risk prior to the final plat approval if the detailed improvement plans have been approved by the Director of the Division of Development Review, provided that such facilities and improvements will be inspected throughout their construction. Final plat approval will be contingent, in part, upon acceptable compliance to County improvement and facility standards.

E. As-Built Plan Requirements. The developer shall submit to the Director of the Division of Development Review one (1) set of prints, one (1) digital AutoCAD drawing file, and one (1) digital file in “.pdf” format of "as-built" plans
for the required infrastructure improvements that have been completed. Storm sewer systems, including culverts, bridges, improved open channels designed in accordance with Section 50.30.5 of the St. Charles County's Design Criteria for the Preparation of Improvement Plans, and stormwater management facilities shall be surveyed after the completion of construction to verify the elevations, dimensions, and locations of the facilities in relation to the approved design. As-Built surveys are not required for typical yard swales designed to drain local subdivision drainage to storm sewer inlets. The "as-built" plans for sanitary systems and water systems shall be required where these systems are not under the jurisdiction of other public agencies. Each set of "as-built" plans shall be certified and sealed by a professional engineer or land surveyor licensed in the State of Missouri.

[Improvement plans for subdivisions which contain three (3) acre or larger lots with private streets or subdivisions which have only private improvements proposed, such as condominium plats, commercial plats or industrial plats with parking areas and no streets, shall be prepared on an exhibit not to exceed twenty-four (24) inches by thirty-six (36) inches and shall contain the following information:

1. The title page shall show:
a.—A key map showing the relationship of the area to be subdivided to the tract and which shall reflect areas of the tract previously subdivided plus adjacent streets.

b.—A north arrow and graphic scale.

c.—A title block showing the name and address of the developer and the engineering firm.

d.—One (1) or more benchmarks on United States Geological Survey (USGS) Datum or a Missouri Department of Transportation (MoDOT) benchmark on USGS Datum in or near the subdivision to which the subdivision is referenced shall be included. No assumed elevations will be accepted.

2. Plan sheets showing horizontal layouts of streets, storm sewers, open channels and detention facilities on a graphic scale no less than one (1) inch equals one hundred (100) feet (1" = 100').

3. Plans for grading and sediment and erosion control shall be in accordance with Chapter 412 of this Unified Development Ordinance.
4. Plan sheets showing the proposed finished grading of the site, including both existing and proposed contours at an interval no greater than five (5) feet on a graphic scale no less than one (1) inch equals one hundred (100) feet (1" = 100'). U.S.G.S. contours may be used, except where street grades will exceed eight percent (8%) or where more accurate contour information is required as deemed necessary by the Director of the Division of Development Review.

5. Profiles of streets and storm sewers on a scale not less than one (1) inch equals fifty (50) feet (1" = 50') horizontal and one (1) inch equals ten (10) feet (1" = 10') vertical. Street elevations are to be shown a minimum of every fifty (50) feet horizontally on tangent sections and a minimum of every twenty-five (25) feet horizontally within a vertical curve. Flow line and top-of-structure elevations are required at all junctions of storm sewer lines. Pipe lengths, diameters, slopes, and material specifications must be provided.

6. Drainage area maps showing the drainage areas of all off-site and on-site stormwater runoff affecting the site.
7. Construction details and typical sections of streets, entrances, open channels, swales and storm sewers as required. Details of all street entrances onto County roads must be at least one (1) inch equals twenty (20) feet (1" = 20'). Enough information must be provided about the entrance geometrics and the intersecting street to determine whether sight distance, vehicle turning movements, and stormwater drainage will be adequate.

8. Hydraulic or any other required engineering calculations sealed and signed by a Missouri registered professional engineer.

F. An applicant for approval of improvement plans for any preliminary plat that is subject to any easement for pipelines, overhead electric lines and other utilities that must be shown on the preliminary plat pursuant to Section 410.110(C)(2)(b) must meet the following requirements, in addition to those set out above.

1. The applicant must depict all such easements of record upon the improvement plans.

2. The applicant must certify to St. Charles County that the applicant has delivered copies of those improvement plans to all holders of such easements with notice to send comments on or consents to those plans to the
Director of the Division of Development Review. The certificate shall also state the date and address of delivery.

No improvement plans may be approved without the consents to those plans from the holders of such easements.

Section 7. Section 410.210, OSCCMo. is hereby amended as follows (additions and updated information in bold type and deletions [bracketed and stricken]):

Section 410.210 Plat Information.

All plats shall include the following information:  
A. Accurate boundary survey to State of Missouri minimum surveying standards with bearings and distances tied to surveyed identification points (established section lines, fractional section lines, and/or U.S. survey lines).
B. Location of lots, streets (including pavement and right-of-way widths), public highways, parks, sidewalks as required, and other features as required, with accurate dimensions to decimals of feet, length, and radii of all curves.
C. Notation on cul-de-sac islands and raised medians, if any. All plats shall include a note stating: "Construction, renovation, alteration or maintenance of any vegetation, landscaping and/or subdivision monuments on any cul-de-sac islands and raised medians in right-of-way dedicated or that may be dedicated to the public for streets maintained by the St. Charles County Highway
Department shall be the responsibility of the subdivision homeowners association under special use permits issued by the St. Charles County Highway Department."

D. Acreage and ownership of all common ground.

E. Location of [detention—areas] stormwater management facilities for stormwater runoff in common ground with feasible vehicular access, fifteen (15) foot width minimum. The plat shall also dedicate to St. Charles County or its successors in interest an easement of access to and in the common ground occupied by any [detention—areas] stormwater management facilities for the purpose of inspection and enforcement of all applicable regulations of such [detention—areas] stormwater management facilities. Placement and preservation of facilities outside of common ground will be considered on case-by-case basis and approved by the Director of Community Development. Justification must be provided for consideration.

F. Watercourses left in their natural state must be shown within common ground, with lot lines set back from the top of the existing bank of the watercourse or the 10-year, 24 hour or 15-year, 20 minute water surface elevation, where no established top-of-bank can be determined, for all subdivisions except those with lots three (3) acres or larger in size, as provided by Part 3, Article VI of Chapter 405 of this Unified Development Ordinance. All plats shall clearly
show the boundaries of any setback from natural watercourses on the subject property which are left in their natural state and provide a note to reference that setback area stating: "There shall be no clearing, grading, construction or disturbance of vegetation except as permitted by Section 405.5026 of the Unified Development Ordinance of St. Charles County, Missouri".

G. Setback lines on front and side streets; location and dimension of utility easements. Areas designated as common ground shall not be dedicated as one (1) blanket utility easement unless approved by the Director of the Division of Planning and Zoning.

H. Designate pipeline and/or overhead electric easements, and with respect to pipeline easements designate all setbacks and restrictions imposed by Section 405.503, Regulations Concerning High Pressure Pipelines.

I. Names of streets and lots numbered in logical order. Streets and names of adjacent subdivision and/or adjacent property owners within one hundred (100) feet in dashed lines.

J. Provide for a fifty-five (55) foot wide pavement radius and sixty-three (63) foot right-of-way radius turnaround where needed.

K. Depict floodway fringe, density floodway, and floodway boundaries, and provide base flood elevations as shown on Flood Insurance Rate Maps (FIRMS) issued by the Federal Emergency Management Agency (FEMA) and the maps presently filed in the office of the Division of Planning and Zoning. Any floodway areas or
wetlands must be designated as common ground on the final plat.

L. Indicate the future street number on each lot.

M. All areas designated as areas for common use and enjoyment by subdivision lot owners shall be shown on the plat as common ground.

N. Depict any existing easements across the property. No final plat shall be approved showing additional existing easements recorded after submittal of the preliminary plat to St. Charles County, unless the Director of the Division of Planning and Zoning determines that those additional existing easements do not encumber land to be dedicated by plat as right-of-way. Depict any existing easements on adjacent properties within one hundred (100) feet of the site that are utilized for the development of the site.

O. Depict all monuments on plat.

P. Notation of right-of-way to be dedicated to the public, whether such dedications are for subdivision streets, future road improvements, or any other public use, shall be in the form of a note on the plat stating:
"The undersigned owners hereby designate the streets and roadways shown hereon as public streets and roadways and dedicate them in trust to St. Charles County, Missouri, for use as right-of-way."

Q. Depict and dedicate all utility easements as specified in Section 410.320(D). Notation for dedication of utility easements shall include the following language:
“The undersigned owners of the real estate described herein do hereby grant and dedicate the areas shown as 'Easements' as perpetual non-exclusive utility easements for sanitary sewers, gas lines, water lines, electric lines, communication lines, other public utility facilities, and all related appurtenances. The perpetual non-exclusive utility easements are hereby granted to [insert applicable utility companies, such as: Public Water Supply District No. 2 of St. Charles County, Missouri, Missouri-American Water Company, Duckett Creek Sanitary District, Cuivre River Electric Company, Union Electric Company d/b/a Ameren Missouri, Laclede Gas, CenturyLink, Charter Communications, East Central Missouri Water and Sewer Authority, AT&T], and to all other public utility providers as their interest may appear, and their successors and assigns, for the installation, use, patrol, access, inspection, maintenance, repair, relocation, and replacement of sanitary sewers, gas lines, water lines, communication lines, electric lines, and other public utility facilities, including all related appurtenances and improvements, the right of temporary use of ground adjacent to said utility easements, not occupied by improvements [limited, however, to five (5) feet on either side of said easement] for the excavation and temporary storage of materials during the installation, inspection, repair, relocation, or replacement of said utility facilities, together with all rights implied by and incidental to the use of said utility easements, including, without limitation, the right of ingress and egress to and from such utility
easements from adjacent property, and the right to trim, control, cut, and remove any and all brush, bushes, saplings, trees, roots, undergrowth, rock, overhanging branches, and other obstructions that adversely impact the function or ability to maintain the utility upon, over, and under the utility easements and the adjacent property. Any utility company or public provider that causes damage to the property shall be responsible to restore the disturbed area as nearly as possible to its prior former condition.”

R. Depict and dedicate all storm sewer easements as required by Section 410.320(E). Notation for dedication of storm sewer easements to the public shall include the following language:

“The undersigned owners hereby dedicate all storm sewer easements identified hereon to St. Charles County, Missouri for St. Charles County’s use for stormwater drainage facilities, with the right of temporary use of adjacent ground not occupied by improvements for the excavation and storage of materials during installation, repair or replacement of said utilities, sewers and drainage facilities.”

Section 8. Section 410.220, OSCCMo. is hereby amended as follows (additions and updated information in **bold** type and deletions [bracketed and stricken]):

Section 410.220 Written Statements.
A. Dedication of all streets, public highways, and land intended for public use, together with the deed book and page of the subdivision restrictions, trust indentures, or street maintenance agreements, and signed by all parties who have mortgage or lien interest, including owner(s).

B. Dedication of all private streets and easements.

C. Certification as to acreage boundaries, monuments made by a registered land surveyor, testifying that the above were made by the surveyor.

D. In the event a subdivision is to have privately maintained streets, storm sewers, stormwater management facilities, and/or common ground, evidence of the methods for controlling and maintaining each private facility shall be submitted with the final plat. Such restrictions or trust indentures must be reviewed by the Divisions of Planning and Zoning and Development Review before they may be recorded. Where any plat includes common ground, that plat shall include a note that title to that common ground shall be conveyed to a homeowners' association or its trustees, and the owner shall convey such title upon establishing such an association and designating its trustees.

E. In cases where the developer proposes to include other regulations (i.e., architectural control, covenants, and deed restrictions), they shall be submitted to the Director of the Division of Planning and Zoning indicating the additional regulations and how they are going to be administered.
F. A letter addressed to St. Charles County by the holder of any easement for pipelines, or for overhead electric lines that must be shown on the preliminary plat pursuant to Section 410.110(C)(2)(b) certifying that the proposed final plat does not impair any rights under that easement or compromise any facilities within it. If such a letter cannot be supplied, submit a letter or affidavit stating the date on which a copy of the proposed final plat was mailed or delivered (as the case may be) to the easement holder or its representative and stating the name and address of that easement holder or its representative.

G. Prior to the recording of the final plat, an entrance permit is needed from the Missouri Department of Transportation if the subdivision has an entrance on a State-maintained right-of-way.

H. A residential housing development must be approved by the Missouri Department of Natural Resources for individual sewage disposal systems on subdivisions containing seven (7) or more lots prior to the approval of the final plat by the Director of the Division of Planning and Zoning.

I. Statement relating to proof of payment of tap-on fees for appropriate sewer district.

J. The above must have all signatures, corporate seal(s) affixed or embossed and be notarized by a notary public prior to the recording of the final plat. All figures and letters on the final plat must be in ink and shall be plain, distinct, and of sufficient size to be easily read, and must be of sufficient density to make a lasting and permanent record.
Section 9. Section 410.410, OSCCMo. is hereby amended as follows (additions and updated information in bold type and deletions [bracketed and stricken]):

Section 410.410 [Public] Storm Sewers, Street Drainage, and Post-Construction Stormwater Management [Other Drain Appurtenances].

A. In addition to the installation of curbs and gutters along the streets as required by this Chapter, storm sewers shall be required. Such systems will be equipped with adequate curb and yard basins, inlets and outlets, and shall be designed in accordance to St. Charles County's Design Criteria for the Preparation of Improvement Plans ["Design Criteria for the Preparation of Improvement Plans", as issued by the St. Charles County Highway Department in February, 2002, or as amended thereafter] and constructed in accordance to the Metropolitan St. Louis Sewer District's "Standard Construction Specifications for Sewers and Drainage Facilities" dated [2000] 2009. The stormwater drainage system shall be separate and independent of the sanitary sewer system. The plans and specifications for the disposing of stormwater shall be approved by the Director of the Division of Development Review.

B. For all subdivisions with lots of one (1) acre or more in size, open drainage swales along the streets may be allowed in lieu of curb and gutter. [Detention basins are required in
accordance with Section 50.80 of St. Charles County's "Design Criteria for the Preparation of Improvement Plans" as issued by the St. Charles County Highway Department in February, 2002, or as amended thereafter. When required, stormwater shall be detained and released at a rate not to exceed the release rate from the site under the existing (pre-developed) conditions for the 2-year and 10-year, 24 hour or the 2-year and 15-year, 20 minute design storm events. Detention basins must be located in common ground that is not located in the floodway area. The minimum maintenance access to a detention facility shall be a fifteen (15) foot strip of common ground on which feasible vehicular access shall be constructed by the developer. Detention basins must also contain some type of overflow structure capable of passing a 100-year, 24 hour or 20 minute design storm. An emergency spillway, capable of passing a 100-year, 24 hour or 20 minute design storm, may also be required by the Director of the Division of Development Review to safely route any basin overflow away from developed areas to a point of stable, natural drainage.

C. Post-construction stormwater management shall be required in accordance with Section 410.410.D of the Unified Development Ordinance and designed in accordance with Section 70 of St. Charles County's Design Criteria for the Preparation of Improvement
 Plans. A maintenance plan and schedule for each stormwater management facility shall be established by the subdivision developer, approved by the Director of the Division of Development Review, recorded and referenced and enforced in the subdivision trust indentures. Stormwater management facilities shall be maintained by the subdivision homeowners. Periodic maintenance shall be required of the facility owners per the approved maintenance plan for the subdivision and Section 420.020 of the Unified Development Ordinance. No modifications shall be made to the facilities without approval from the Department of Community Development. [For all subdivisions with lots of one (1) acre or more in size, open drainage swales along the streets may be acceptable, if they are conducive to the area, non-erosive, and approved on the preliminary plat. Plans must be approved by the Director of the Division of Development Review.]

D. Post-Construction Stormwater Management - When Required

1. Water Quality.

   a. The requirement to provide measures to protect stormwater quality shall be evaluated for all proposed subdivision developments
submitted to the Community Development Department for review and approval.

b. Water quality treatment is required for all new subdivision developments that disturb an area one acre or greater, including subdivision developments less than one acre that are part of a larger common plan or development, as follows:

i. For all new subdivision developments, measures shall be designed and implemented to prevent or minimize water quality impacts to the maximum extent practicable.

ii. For all infill and redevelopments, water quality strategies and technologies, including those that reduce runoff volume, shall be effectively used to the maximum extent practicable. Infill and redevelopments that are subject to but which cannot meet the full water quality requirement due to physical constraints shall be evaluated on a case-by-case basis.
c. Water quality treatment is not required in residential subdivision developments with three (3) acre or larger lot sizes.

d. If there are known stormwater problems, impaired waterbodies, or other special conditions downstream from a subdivision development, water quality treatment shall be required regardless of land disturbance size.

2. Stormwater Detention – Channel and Flood Protection

a. The requirement of stormwater detention shall be evaluated for all proposed subdivision developments submitted to the Community Development Department for review and approval.

b. New residential subdivision developments with three (3) acre or larger lot sizes and all other new subdivision developments that have a differential runoff of less than two (2) cfs for the 15-year, 20-minute event shall be exempt from detention requirements for channel and flood protection unless there are known storm water problems, impaired
waterbodies, or special conditions downstream from the proposed subdivision development.

c. Detention for channel protection (CPv) shall not be required where the one-year post development peak discharge is less than or equal to 2.0 cfs for the entire subdivision development. Channel protection (CPv) shall not be required if the subdivision development discharges directly to permanent lakes or to enclosed pipe systems with adequate hydraulic capacity that discharge to permanent lakes or stormwater management facilities.

d. The flood protection (Qp) requirements may be waived by the Director of the Division of Development Review where conveyance is provided directly to a major river system, lake, or wetland that have capacity to handle flow increases at the 10-year level and where it would benefit to discharge the peak flows from the site prior to the peak flows in the receiving, natural system.

e. If there are known storm water problems, impaired waterbodies, or
other special conditions downstream
from a subdivision development,
detention for channel and flood
protection may be required at the
discretion of the Director of the
Division of Development Review
regardless of differential runoff or
minimum lot size.

Section 10. Section 410.440, OSCCMo. is hereby amended as
follows (additions and updated information in bold type
and deletions [bracketed and strikethrough]):

Section 410.440 Inspection.

A. Prior to starting any of the work covered by the
above plans, after approval thereof, the developer
shall make arrangements to provide for inspection
of the work, sufficient, in the opinion of the County
Engineer (or, in the case of [detention basins]
stormwater management facilities, in the opinion
of the Director of Development Review), to assure
compliance with the plans and specifications as
approved.

B. The County Engineer, or a duly authorized
representative, shall make all necessary inspections
of all pavement and storm sewer construction,
along with all storm sewer construction and
sanitary sewer construction within the right-of-
way.
C. The Director of Development Review, or a duly authorized representative, shall make all necessary inspections of all stormwater management facilities.

D. A minimum of twenty-four (24) hours' notice shall be given to the County Engineer's office and the office of the Director of Development Review prior to the commencement of construction.

Section 11. Section 410.460, OSCCMo. is hereby amended as follows (additions and updated information in **bold** type and deletions [bracketed and stricken]):

Section 410.460 Maintenance and Supervision.

Where the subdivision contains sewers, sewage treatment plants, water supply systems, stormwater management facilities, or other physical facilities that are necessary or desirable for the welfare of the area or that are of common use or benefit and which are not or cannot be satisfactorily maintained by an existing public agency, provision shall be made which is acceptable to the agency having jurisdiction over the location and maintenance of such facilities and for the proper and continuous operation, maintenance, and supervision of such facilities.

Section 12. Section 412.080, OSCCMo. is hereby amended as follows (additions and updated information in **bold** type and deletions [bracketed and stricken]):

Section 412.080 Performance Guaranty.
In order to obtain a land disturbance permit, the applicant must insure or guarantee the stabilization of the site upon completion or stoppage of the land disturbance activity. A. The applicant, or a contractor for the applicant, shall post a performance guarantee with the County in the amount established in this Section.

1. If the performance guarantee is a lender's or escrow agreement, that agreement shall:
   a. Be prepared on forms developed by the Director of the Division of Development Review and approved by the County Counselor and be signed by the Director of the Division of Development Review and County Registrar;
   b. Ensure or guarantee the installation of sediment and erosion controls and the final stabilization of ground cover based on amounts established in Section 412.080(B) and approved by the Director of the Division of Development Review; and
   c. Be held in a special account by the escrow holder or lender at offices in St. Charles County, the City of St. Louis or Missouri counties contiguous to St. Charles County, and the funds shall be subject to the audit of St. Charles County.

2. If the performance guarantee is a standby letter of credit or a certified check, the applicant, or a contractor for the applicant, and the County shall enter into a fully
executed deposit agreement prepared on forms developed by the Director of the Division of Development Review and approved by the County Counselor and signed by the Director of the Division of Development Review and the County Registrar, which shall require the applicant, or a contractor for the applicant, to fulfill the obligations imposed in this Section. A standby letter of credit may be prepared on forms provided by the financial institution on which it is drawn but must be approved by the County Counselor and must, at a minimum, provide for:

a. Drafts to be drawn at offices in St. Charles County, the City of St. Louis, or Missouri counties contiguous to St. Charles County; and

b. Automatic extensions for additional one-year terms unless, at forty-five (45) days prior to the letter's then-current expiration date, the financial institution issuing the letter gives written notice of non-renewal to St. Charles County's Department of Community Development by registered or certified mail or by overnight courier.

B. Amount Of Performance Guarantee. The amount of the performance guarantee shall be determined by a line-item cost estimate prepared by or on behalf of the applicant and approved by the Director of the Division of Development Review using current market value of the materials and
labor for all erosion and sediment controls and other proposed construction items referenced in Section 412.060(A)(1)(t), (2)(c), (2)(d), and/or (3)(a).

C. Release of Performance Guarantee Funds.

1. The Director of the Division of Development Review may authorize release up to fifty percent (50%) of any performance guarantee funds upon confirming by inspection that all erosion and sediment controls and other proposed construction items referenced in Section 412.060(A)(1)(t), (2)(c), (2)(d), and/or (3)(a) are in place and functioning properly, including establishment of vegetation.

2. The Director of the Division of Development Review may authorize release up to ninety percent (90%) of any performance guarantee funds [subject to an escrow or lender's agreement] upon confirming by inspection that vegetation has been established, [and] ongoing maintenance has been provided for all installed erosion and sediment controls, and all stormwater management facilities are completed and protected where performance guaranty funds are being held for stormwater management facilities in a non-subdivision development per Section 405.525.D.12. However, the amount retained shall not be reduced to less than the
cost of maintaining the erosion and sediment controls and completing said remaining stormwater management facility improvements.

3. The Director of the Division of Development Review shall authorize release of all remaining performance guarantee funds only when the County Inspector certifies that all land disturbance work has been completed, all temporary sediment and erosion control measures have been properly removed or abandoned, all tree preservation requirements have been met, all permanent site improvements have been constructed and approved, including stormwater management facilities in a non-subdivision development required per Section 405.525.D.12, and all soil subject to the land disturbance permit is stabilized, including permanent vegetation.

Section 13. Section 420.020, OSCCMo. is hereby amended as follows (additions and updated information in bold type and deletions [bracketed and stricken]):

Section 420.020 Inspection, Maintenance and Repair of Detention Basins and Other Storm Water Management Facilities.

A. Definitions. In this Section, the following words and terms are defined as provided below.

DAY
A calendar day.

DETENTION BASIN
See definition in Section 405.060 of the Unified Development Ordinance of St. Charles County, Missouri.

DIRECTOR
The Director of the Division of Development Review or his or her designee.

ST. CHARLES COUNTY
The unincorporated part of St. Charles County, Missouri.

STORM WATER MANAGEMENT FACILITY
[A facility designed and installed to intercept, detain, retain, infiltrate, evaporate, transpire, filter, and/or convey surface storm water runoff, including but not limited to such facilities as detention basins, storm water harvesting facilities, rain gardens, bioswales, bio-retention basins, engineered wetlands, sand and other proprietary filter systems, pervious pavement, etc., for the purposes of removing pollutants, reducing or controlling storm water volume, maintaining pre-development hydrology, and/or flood control.] See definition in Section 405.060 of the Unified Development Ordinance of St. Charles County, Missouri.

UNIFIED DEVELOPMENT ORDINANCE
The Unified Development Ordinance of St. Charles County, Missouri,
Chapters 405 and 410 and 412 of the Ordinances of St. Charles County, Missouri.

B. Inspection Program. The Director shall inspect all storm water management facilities in St. Charles County as provided below.

1. Inspection schedule. Except as provided in Subsection (E), the Director shall inspect each detention basin and may inspect any other storm water management facility in St. Charles County as provided below.
   a. The Director shall inspect each detention basin every five (5) years. The first (1st) inspection of any detention basin built and approved after the effective date of this provision shall be no sooner than one (1) year after the basin's initial inspection and approval under the applicable provisions of the Unified Development Ordinance. Later inspections shall take place at least every five (5) years.
   b. The Director may inspect any other storm water management facility as necessary to ensure that it continues to perform as designed.

2. Consent to inspections. Property owners or their successors in interest shall be deemed to have consented to continued inspections under this provision by submission to and approval by St. Charles County of plans for detention basins and/or other storm water management facilities and (as applicable) their maintenance pursuant to the
provisions in the Unified Development Ordinance for approval of site plans or improvement plans.

3. *Inspection standards.* In all inspections conducted under this provision, the Director shall determine whether the detention basin and/or other storm water management facility under inspection is maintained to the following standards:

   a. The site plan or improvement plan for the detention basin and/or other storm water management facility approved by St. Charles County pursuant to the Unified Development Ordinance or previously adopted ordinances or orders or regulations; and
   b. The Property Maintenance Code of St. Charles County; and
   c. The performance and inspection criteria for detention basins and/or other storm water management facilities duly promulgated by the Director; and
   d. The inspection and maintenance plan attached to the agreement and restrictions for the storm water management facility as authorized by ordinance or the inspection and maintenance program included in subdivision plats or indentures.

C. *Promulgation Of Performance And Inspection Criteria.* The Director shall develop and distribute to owners of detention basins and/or other storm water management facilities.
water management facilities performance and inspection criteria required above.

D. *Entry For Purposes Of Inspection, Notice.* Except where consent to inspection is deemed granted as provided in Subsection (B) above, the Director may inspect any detention basin and/or storm water management facility in St. Charles County only after ten (10) days' written notice. Such notice shall be by U.S. mail to owners of storm water management facilities serving properties that are under single ownership. In all other cases, such notice shall be posted as follows. In the case of a basin and/or other facility serving several properties or a subdivision, notices shall be posted:

1. At all entrances to the subdivision;
2. On the right-of-way closest to the basin and/or other facility;
3. At the entrance to any easement of access to that basin and/or other facility; and
4. At the basin's and/or other facility's site if accessible.

In addition, if a subdivisions' trustees are reasonably identifiable, or if an owner has designated a registered agent as provided by applicable law, the Director shall give those persons ten (10) days' written notice by U.S. mail.

E. *Violations And Corrections.* If upon inspection the Director finds that a detention basin and/or other storm water management facility violates any of the inspection standards set out above, the Director shall take one (1) of the following actions.
1. If, based on inspections and review of County records, the Director finds that a detention basin that was approved for installation before August 1, 1986, no longer exists as of January 1, 2011, and further finds that the basin's absence causes no or minimal harm to storm water management and to surrounding or affected properties in the basin's watershed, the Director may in his/her discretion notify the basin's owner of the violation and of that determination. The notice shall further provide that no corrective action is required of the non-existent basin's owner and that the Director is removing the non-existent basin from the requirements of Section 420.020, OSCCMo.

2. If, based on inspections and on a consideration of surrounding or affected properties in any basin's or facility's watershed, the Director determines that a violation in the condition of an existing basin or facility causes no or minimal harm to storm water management and to surrounding or affected properties in the basin's watershed, the Director may in his/her discretion notify the facility's owner of the violation and of that determination. The notice shall state, however, that the basin or facility may be inspected as often as every one (1) year so long as the violation persists, and that the Director may order correction of the violation in the future if it is later found
to result in adverse effects to storm water management.

3. If the Director cannot make a determination of no or minimal harm under paragraphs (1) and (2), above, the Director shall send the owner or owners by first class mail a written notice detailing those violations and requiring submission of a corrective action plan with deadlines for abating those violations within no more than twenty (20) days of the date of the notice. For good cause shown, and provided there is no immediate harm to the public welfare, the Director may grant the owner or owners a reasonable extension for submitting that corrective action plan. The Director may approve the plan as submitted or require its amendment within no more than fourteen (14) days. The notice shall also state that the detention basin or storm water management facility will be inspected every one (1) year until inspections reveal no violations and may be inspected thereafter at the discretion of the Director but at least every five (5) years.

F. Abatement Or Legal Action By The Director. If the owner or owners fail to secure approval of a corrective action plan or fail to comply with an approved plan or in any other way fail to correct the violations of which the Director notified them, the Director shall take one (1) of the following actions.

1. The Director, after reasonable notice and an opportunity for hearing given to the owner or
owners of the detention basin and/or other storm water management facility, shall order the same done and the costs assessed against the property of the owners as a special tax lien. In the case of detention basins and/or other storm water management facilities within common ground in subdivisions, such assessments shall be imposed upon all lots within the subdivision in question.

2. Alternatively, the Director may request the County Counselor to institute an appropriate action for fines and/or injunctive relief against the owners or persons responsible for the detention basin and/or other storm water management facility in violation. Any person responsible for a violation of this Section shall be guilty of a misdemeanor and liable for a fine not to exceed one thousand dollars ($1,000.00) a day. Every day that such violation is ongoing shall constitute a separate violation.

Section 14. Except as provided in Section 14, below, this ordinance shall be in full force and effect from and after the date of its passage and approval.

Section 15. This ordinance is subject to penalty provisions for its violation and therefore, for penal purposes, shall be effective thirty-one (31) days after its posting in six public places, its publication in full on the web site of St. Charles County, and the publication of its title and the location in St. Charles County where it may be viewed in its entirety in a legal publication or a newspaper of general circulation in St. Charles County.
December 21, 2020
DATE PASSED

December 29, 2020
DATE APPROVED BY COUNTY EXECUTIVE

[Signature]
CHAIR OF THE COUNCIL

[Signature]
COUNTY EXECUTIVE

ATTEST:

[Signature]
COUNTY REGISTRAR

10.00 Definitions

Best Management Practices (BMPs) – Control measures taken to mitigate changes to both quantity and quality of urban runoff caused through changes to land use. BMPs can be classified as "structural" or "non-structural". Stormwater BMPs are designed to reduce or mitigate stormwater volume, peak flows, velocities and/or nonpoint source pollution through evapotranspiration, infiltration, detention, and filtration or biological and chemical actions.

County Engineer – The County Engineer of the St. Charles County Highway Department.

Department – For the purpose of this publication, the St. Charles County Community Development Department.

Development – 1. The act of changing and the state of a tract of land after its function has been purposefully changed by man including, but not limited to, structures on the land and alterations to the land. 2. The limits and physical location of the land alterations.

Development, New – Land disturbing activities, structural development (construction, installation, or expansion of a building or other structure), and/or creation of impervious surfaces on a property that had no previous development.

Development, Pre-Development – The site in its natural, undisturbed conditions prior to any development including agricultural use. Where natural conditions cannot be determined, the pre-developed hydrologic condition and cover type shall be assumed to be “Meadow – continuous grass, protected from grazing and generally mowed for hay” with Curve Numbers of 30, 58, 71, 78 for hydrologic soil conditions A-D, respectively, and 5% impervious.

Development, Redevelopment – Structural development (construction, installation, or expansion of a building or other structure), creation or addition of impervious surfaces, replacement of impervious surfaces not as part of routine maintenance, and land disturbing activities associated with structural or impervious development on a previously developed site. Redevelopment does not include such activities as exterior modeling.

Differential Runoff – For New Development, the difference in rate and volume of stormwater runoff from a development between its pre-development (natural) condition and its developed condition. For subsequent development of a previously developed site, the difference in rate and volume of stormwater runoff from a development between its developed condition in 2012 and its final developed condition.

Director – For the purpose of this publication, the Director of the Division of Development Review.

Highway Department – For the purpose of this publication, the St. Charles County Highway Department.
Non-Structural Controls – Pollution prevention practices that focus on management by limiting or eliminating pollutants before they end up in stormwater. Non-structural controls may include but are not limited to; site and land use planning, natural resource conservation, vegetated filters, stream buffers, tree preservation, low impact development (LID), and open space preservation.

Stormwater Management Facility – A facility designed and installed to intercept, detain, retain, infiltrate, evaporate, transpire, filter, and/or convey surface storm water runoff, including but not limited to such facilities as detention basins, storm water harvesting facilities, rain gardens, bio-swales, bio-retention basins, engineered wetlands, sand and other proprietary filter systems, pervious pavement, etc., for the purposes of removing pollutants, reducing or controlling storm water volume and rate, maintaining pre-development hydrology, and/or flood control.

Structural Controls – Pollution prevention practices that require the construction or use of a device to capture or prevent pollution in stormwater runoff. Structural controls may include but are not limited to extended detention basins, bio-retention, infiltration basins, stormwater wetlands, bio-swales, vegetative lined ditches, subsurface drains, permeable pavement, sand filter basins, stormwater planters, proprietary BMPs, storage tanks, and hydrodynamic separators.

70.00 Design Criteria & Guidelines for Post-Construction Stormwater Management

70.00.1 Purpose

Two (2) consequences of construction and development are increased runoff created by the changed properties of the ground surface and the rate of discharge of this increased runoff. These are both of great relevance to stormwater management. The natural condition of the land before development is in relative balance with the natural capacity of the receiving streams. Normally, the pre-development conditions provide greater permeability and longer times of concentration. By modification of the ground surface from irregular, pervious and vegetation-covered, the areas are changed to more impervious, more quickly drained and, in some cases, denuded of vegetation. It is the policy of the County to protect and promote the public health, safety and general welfare. The management of stormwater will reduce the erosion on land and in and along stream channels, will reduce the possibility of damage to public and private property, will assist in the attainment and maintenance of water quality standards, and will preserve the environmental quality of the watercourses in the County.

The basic goal of stormwater management is to align water quantity and water quality management techniques in such a way as to prevent further deterioration of our watersheds. Techniques for addressing these goals include maintaining natural, existing conditions, managing peak flows and volume, and reducing pollutants.

1. **Natural Resource Conservation, Runoff Reduction.** Better site plans and site design practices preserve existing vegetation and habitat, introduce native landscaping for water quality treatment, and protect streams from degradation by preventing stormwater impacts rather than mitigating them.

2. **Water Quality.** Development increases the concentration and number of different pollutants carried by runoff. As it runs over rooftops, lawns, parking lots, and industrial sites, stormwater picks up and transports a variety of pollutants to downstream
waterbodies. In order to preserve the quality of water in natural streams, it is important to provide mechanisms to remove contaminants on the site prior to water entering the natural watercourse. Water quality protection and treatment should be seamlessly integrated between preservation of natural site features that absorb rainfall to practices that use natural processes to treat pollutants as they infiltrate, convey, and detain runoff. A basic goal is to maintain or improve pre-development peak flows, runoff volumes, and water quality.

3. **Stream Impairment/Erosion.** Increased runoff volumes and peak flows increase the frequency and duration of smaller bank-full and near bank-full events which are the primary channel forming events. Changes in the rates and amounts of runoff generated from developed watersheds directly affect the morphology, or physical shape and character, of streams and rivers impacting stream widening, bank erosion, downcutting, loss of stream buffer and riparian canopy, and disconnection from the natural floodplain. Peak flows and velocities from channel forming storm events shall be managed and conveyed to streams without causing erosion, degradation, or pollution.

4. **Flooding.** The increased stormwater runoff rates and volumes resulting from the land development process also cause an increase in the frequency, duration and severity of overbank and extreme flooding events. In other words, as more development occurs without proper stormwater management, our natural and man-made infrastructure becomes more vulnerable to flooding. Peak flows shall be managed to maintain pre-development rates for overbank flooding events and be safely conveyed to streams during extreme flooding events.

5. **Reduced Costs of Construction & Maintenance.** State-of-the-art stormwater designs that mimic natural processes should be less expensive to build, more durable and less expensive to maintain, and better protect streams and other infrastructure.

6. **Recreation and Amenities.** Stormwater BMPs (such as stream buffers, native landscaping, preservation of tree canopy, ponds & wetlands) create open space, promote passive recreation, and should provide aesthetic, natural settings. Stormwater management should serve as an amenity to development.

7. **Economic Development, Property Value, Quality of Life.** Natural areas attract development. Natural areas, landscaping, and water quality BMPs should improve adjacent property values, recreational opportunities, and overall quality of life.

8. **Regulatory Compliance.** Stormwater management and the implementation of best practices help comply with water quality regulations of the National Pollutant Discharge Elimination System established under the Clean Water Act and the MS4 General State Operating Permit issued by the Missouri Department of Natural Resources.
Design Criteria

Post-construction stormwater management measures and facilities shall be required and designed according to the criteria defined in this section.

70.10.1 When Required

70.10.1.1 Water Quality

1. The requirement to provide measures to protect stormwater quality shall be evaluated for all proposed developments submitted to the Department for review and approval and may be required, if deemed necessary. Stormwater management measures shall be provided and designated in accordance with the requirements of this section. See Table 70-1 for a summary of stormwater management requirements by development type.

2. Water quality treatment is required for all developments that disturb an area greater than or equal to one acre, including developments less than one acre that are part of a larger common plan or development, as follows:

   a. For all new developments, controls shall be designed and implemented to prevent or minimize water quality impacts to the maximum extent practicable. This includes assessment of site characteristics at the beginning of design with the goal of protecting sensitive areas, minimizing the creation of stormwater pollution, and utilizing Best Management Practices (BMPs) that effectively remove stormwater pollution. This can be achieved by reasonably mimicking pre-construction runoff conditions, such as reducing runoff volume through infiltration, evapotranspiration, and/or rainwater harvesting or reuse.

   b. For all infill and redevelopments, water quality strategies and technologies, including those that reduce runoff volume, shall be effectively used to the maximum extent practicable. Infill and redevelopments that cannot meet the full water quality requirement due to physical constraints shall be evaluated on a case-by-case basis.

3. Water quality treatment is not required in residential subdivision developments with three (3) acre or larger lot sizes.

4. If there are known stormwater problems, impaired waterbodies, or other special conditions downstream from a development, water quality treatment shall be required regardless of land disturbance size.

70.10.1.2 Stormwater Detention - Channel & Flood Protection

1. The requirement of stormwater detention shall be evaluated for all proposed developments submitted to the Department for review and approval and may be required, if deemed necessary. Detention facilities shall be provided and designated in accordance with the requirements of this section. See Table 70-1 for a summary of stormwater management requirements by development type.
2. New residential subdivision developments with three acre or larger lot sizes, subdivision developments that have a differential runoff of less than two (2) cfs for the 15-year, 20-minute event, and non-residential/commercial developments that have a differential runoff of less than three and one half (3.5) cfs for the 15-year, 20-minute event shall be exempt from detention requirements for channel and flood protection unless there are known storm water problems, impaired waterbodies, or special conditions downstream from the proposed development.

3. Subsequent development of previously developed sites without prior stormwater detention shall be evaluated based on the development condition of the site in 2012. Channel and flood protection shall be required when subsequent development has a differential runoff since 2012 that equals three and one half (3.5) cfs or greater for the 15-year, 20-minute event. Redevelopments that cannot meet this requirement due to physical constraints shall be evaluated on a case-by-case basis.

4. Redevelopments and subsequent development of previously developed sites with prior stormwater detention are exempt from providing additional channel and flood protection for the existing runoff. These projects shall provide channel and flood protection for any increase in runoff. When existing stormwater management facilities will be used to accommodate the increase in runoff from subsequent development or redevelopment, the facilities shall be retrofitted to meet the current post-construction stormwater management requirements for the additional runoff. Redevelopments that cannot meet this requirement due to physical constraints shall be evaluated on a case-by-case basis.

5. Detention for channel protection (CPv) shall not be required where the one-year, 24-hour post development peak discharge is less than or equal to 2.0 cfs for the entire development. Channel protection (CPv) shall not be required if the development discharges directly to permanent lakes or to enclosed pipe systems with adequate hydraulic capacity that discharge to permanent lakes or stormwater management facilities.

6. The flood protection (Qp) requirements may be waived by the Director where safe and effective conveyance is provided directly to a major river system, lake, or wetland that have capacity to handle flow increases at the 10-year level and where it would benefit to discharge the peak flows from the site prior to the peak flows in the receiving, natural system.

7. If there are known storm water problems, impaired waterbodies, or other special conditions downstream from a development, detention for channel and flood protection may be required at the discretion of the Director regardless of differential runoff or minimum lot size.
Table 70-1 Stormwater Management Requirements By Development Type

<table>
<thead>
<tr>
<th>Development Type</th>
<th>Required Stormwater Management</th>
<th>Water Quality (WQv)</th>
<th>Channel Protection (CPv)(^4)</th>
<th>Flood Protection (Qp)(^4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infill/Redevelopment</td>
<td></td>
<td>LD ≥ 1 acre(^1)</td>
<td>Q(<em>{15}) differential ≥ 3.5 cfs since 2012 and Q(</em>{1}) development &gt; 2 cfs(^{1,2,3})</td>
<td>Q(_{15}) differential ≥ 3.5 cfs since 2012(^{1,2,5})</td>
</tr>
<tr>
<td>New Private Commercial – Not in Subdivision</td>
<td></td>
<td>LD ≥ 1 acre</td>
<td>Q(<em>{15}) differential ≥ 3.5 cfs and Q(</em>{1}) development &gt; 2 cfs(^3)</td>
<td>Q(_{15}) differential ≥ 3.5 cfs(^5)</td>
</tr>
<tr>
<td>New Commercial/Industrial Subdivision and &lt; 3 Acre Lot Residential Subdivision</td>
<td></td>
<td>LD ≥ 1 acre</td>
<td>Q(<em>{15}) differential ≥ 2 cfs and Q(</em>{1}) development &gt; 2 cfs(^3)</td>
<td>Q(_{15}) differential ≥ 2 cfs(^5)</td>
</tr>
<tr>
<td>New &gt; 3 Acre Lot Residential Subdivision</td>
<td>Not Required</td>
<td>Not Required</td>
<td>Not Required</td>
<td>Not Required</td>
</tr>
</tbody>
</table>

\(^1\) Infill development and redevelopments that cannot meet the full water quality, channel protection, or flood protection requirements due to physical site constraints shall be evaluated on a case-by-case basis.

\(^2\) Previously developed sites with prior stormwater detention are exempt from providing additional channel and flood protection for the existing runoff. These projects shall provide channel and flood protection for any increase in runoff.

\(^3\) Not required where the development discharges directly to permanent lakes or to enclosed pipe systems with adequate hydraulic capacity that discharge to permanent lakes or stormwater management facilities.

\(^4\) If there are known storm water problems, impaired waterbodies, or other special conditions downstream from a project development, detention for channel and flood protection may be required at the discretion of the Director regardless of differential runoff or minimum lot size.

\(^5\) Flood protection requirements may be waived by the Director where safe and effective conveyance is provided directly to a major river system, lake, or wetland that have capacity to handle flow increases at the 10-year level and where it would benefit to discharge the peak flows from the site prior to the peak flows in the receiving, natural system.

70.10.2 Design Standards and Sizing Criteria

70.10.2.1 Stormwater Management Standards
1. **Natural Resource Conservation and Better Site Design Practices.** The identification, and subsequent preservation and/or restoration of existing natural resources, through the use of better site design practices, helps reduce the negative impacts of the land development process “by design.” The goal is to reduce the amount of stormwater runoff and pollutants that are generated, provide for natural on-site control and treatment of runoff, and optimize the location of stormwater management facilities. Better site design concepts can be viewed as both water quantity and water quality management tools and can reduce the size and cost of required BMPs. The use of certain better site design practices that provide water quality benefits allows for a reduction (or “credit”) of the water quality volume.

2. **Runoff Reduction.** Runoff reduction practices shall be sized and designed to retain rainfall on the site to the maximum extent practicable. Runoff reduction practices are stormwater BMPs used to disconnect impervious and disturbed pervious surfaces from the storm drain system, thereby reducing post-construction stormwater runoff rates, volumes, and pollutant loads. Runoff reduction practices inherently reduce total suspended solids (TSS) and other pollutants to provide water quality treatment (i.e. 100% pollutant removal for stormwater retention, infiltration, evaporation, transpiration, or rainwater harvesting and reuse). The water quality treatment volume in 70.10.2.3 shall be waived, if 0.9 inch of rainfall can be retained onsite using runoff reduction methods. If the entire 0.9-inch runoff reduction standard cannot be achieved, the remaining runoff from the 1.14-inch rainfall event must be treated by BMPs to remove at least 80% of the calculated average annual post-development TSS loading from the site per 70.10.2.3.

3. **Water Quality.** Stormwater management facilities shall be designed to retain or treat the runoff from 90% of the storms that occur in an average year and reduce average annual post-development total suspended solids loadings by 80%. This equates to treating storm events of 1.14 inches or less, as well as the first 1.14 inches of runoff for all larger storm events. This standard is quantified and expressed in terms of engineering design criteria through specification of the water quality volume (WQv). The WQv must be treated to the 80% TSS removal performance goal.

4. **Stream Channel Protection.** Stream channel protection shall be provided by using 24-hour extended detention storage of the 1-year, 24-hour return frequency storm event, erosion prevention measures such as energy dissipation and velocity control, and preservation of the applicable stream buffer. The extended detention standard is intended to reduce the frequency, magnitude and duration of post-development bank-full flow conditions. The volume to be detained is also known as the channel protection volume (CPv). The use of nonstructural site design practices and runoff reduction BMPs that reduce the total amount of runoff may also reduce CPv by a proportional amount. Where runoff reduction practices are used, an adjusted curve number (CN) is computed that is lower than the original CN based on an actual stormwater volume removed from the total runoff (see Section 70.30.1).

5. **Overbank and Extreme Flood Protection.** Overbank flood protection shall be provided by controlling the post-development peak discharge rate ($Q_p$) to the pre-development rate
(natural or existing condition, as applicable) as required in 70.10.2.5. Extreme flood protection shall be provided by safely conveying the 100-year, 24-hour storm event. This is accomplished by sizing the onsite conveyance system to safely pass the extreme storm event. The use of nonstructural site design practices and runoff reduction BMPs that reduce the total amount of runoff will also reduce Qp by a proportional amount. Where runoff reduction practices are used, an adjusted curve number (CN) is computed that is lower than the original CN based on an actual stormwater volume removed from the total runoff (see Section 70.30.1).

70.10.2.2 Numerical Sizing Criteria

This section presents the sizing criteria for stormwater management facilities to meet pollutant removal goals, reduce channel erosion, prevent or reduce flooding, and pass extreme storm and flood events. A brief summary is listed below.

<table>
<thead>
<tr>
<th>Stormwater Volume²</th>
<th>General Criteria &amp; Calculation Method</th>
</tr>
</thead>
</table>
| Water Quality Volume (WQv) | WQv shall be treated using one of the allowable BMPs where RRv is not fully retained  
  WQv = \((P/12)(Rv)(A*43,560)\)  
  P = rainfall depth = 1.14 in.  
  Rv = volumetric runoff coefficient  
  A = area in acres |
| Runoff Reduction Volume (RRv) | RRv = \([(P/12)(Rv)(A*43,560)]\)  
  P = target runoff reduction rainfall = 0.9 in.  
  Rv = volumetric runoff coefficient  
  A = area in acres |
| Channel Protection Storage Volume (CPv) | CPv = 24 hour extended detention of post-developed one-year, 24-hour storm event |
| Flood Protection Volume³ (Qp₁₀, Qp₁₀₀) | The post-developed routed peak flow from the site shall not exceed the pre-development routed peak flow for the 10-year, 24-hour event or the allowable release rates for applicable watersheds. Calculated using NRCS unit hydrograph method routed through basin. The conveyance system shall be designed to safely control and convey the peak flows from the Qp₁₀₀ event. |

1 Portions of the water quality volume (WQv) can be satisfied by providing for its treatment in combination with a channel protection volume (CPv) facility (See Sections 70.10.2.3 and 70.10.2.4).

2 Subtractions for Non-structural Practices: When non-structural practices are employed in the site design, the WQv and to a lesser extent the CPv and Qp can be reduced in accordance with the conditions outlined in Section 70.30.1.
In developments where channel protection is not required and flood protection is, the post-developed peak flow from the site may not exceed the pre-development peak flow for the 2-year, 24-hour event and the 10-year, 24-hour event.

70.10.2.3 Water Quality – Runoff Reduction Volume (RRv) & Water Quality Volume (WQv)

1. The Runoff Reduction approach to the Water Quality sizing criterion, denoted RRv, specifies the reduction or elimination of the total pollution load inherent in stormwater runoff by intercepting and reducing or eliminating the first 0.9 inch of rainfall, or to the maximum extent practicable. The RRv is directly related to the amount of impervious cover at a site. In numerical terms, it is equivalent to a rainfall depth of 0.9 inch multiplied by the volumetric runoff coefficient (Rv) and the site area. The following equations are used to determine RRv:

\[ \text{RRv} = \left( \frac{P}{12} \right) (Rv) (A \times 43,560) \]

Where:

- RRv = target runoff reduction volume (ft\(^3\))
- P = 0.9 inch of rainfall
- Rv = \(0.05 + 0.009(I)\)
- I = percent impervious cover (in percent; eg. 100\% = 100, 75\% = 75 – see Table 50-1 for minimum impervious percentages)
- A = area in acres

2. WQv is the storage needed to capture and treat the runoff from 90\% of the recorded daily rainfall events. In numerical terms, it is equivalent to 1.14 inches of rainfall multiplied by the volumetric runoff coefficient (Rv) and site area. The WQv is directly related to the amount of impervious cover created at a site. A minimum WQv of 0.2 inches per acre shall be met at all sites where WQv is required. The following equations are used to determine WQv:

\[ \text{WQv} = \left( \frac{P}{12} \right) (Rv) (A \times 43,560) \]

Where:

- WQv = water quality volume (ft\(^3\))
- P = 1.14 inches of rainfall
- Rv = \(0.05 + 0.009(I)\)
- I = percent impervious cover (in percent; eg. 100\% = 100, 75\% = 75 – see Table 50-1 for minimum impervious percentages)
- A = area in acres

3. As a basis for determining water quality treatment volume, the following assumptions shall be made:
a. Percent Impervious Cover (I) must be based on Zoning District and shall use the minimum impervious percentages in Table 50-1. The Engineer shall provide adequate detailed computations for any proposed, expected or contingent increases in imperviousness and shall make adequate allowances for changes in zoning use. If consideration is to be given to any other value, the request must be made prior to the submittal of improvement plans, must be reasonable and fully supported, and must be approved in writing by the Director before its use is permitted.

b. Measuring Impervious Cover: The measured area of a site plan that does not have vegetative or permeable cover shall be considered total impervious cover, including any rock surface supporting vehicular traffic.

c. The WQv for offsite areas is not required if the offsite flows bypass the water quality facilities. If offsite runoff flows into the water quality facility, the WQv calculation must include the offsite area. Offsite areas are defined as those areas that are not a part of the proposed development but produce runoff that flows to the proposed development.

d. Multiple Drainage Areas: When a project contains or is divided by multiple drainage areas, the entire WQv shall be addressed for each drainage area (i.e. the WQv in one drainage area cannot be increased to compensate for no or reduced WQv in another drainage area). The Director may waive this requirement where site constraints do not allow for the effective use of BMPs such as on remote lots. However, the sum of these waived areas may not exceed 5% of the total disturbed area (not including common ground or conservation easements) of the proposed development.

e. BMP Treatment: The final RRv/WQv shall be treated by an acceptable BMP(s) per Section 70.30 or as approved by the Director.

f. Subtractions for Non-structural Practices: When non-structural practices are employed in the site design, the WQv can be reduced in accordance with the conditions outlined in Section 70.30.1.

g. Extended Detention (ED) for WQv: The water quality requirements can be met by providing a 24-hour draw down of a portion of the water quality volume (WQv) in conjunction with a stormwater pond or wetland system. Referred to as ED, this is different than providing the extended detention of the one-year storm for the channel protection volume (CPv). If the same pond or wetland is used for the CPv, the ED portion of the WQv may be included when routing the CPv.

h. Water quality portions of a BMP may not serve as a sediment control device during the site construction phase after the BMP is under construction. In addition, the erosion and sediment control plan for the site must clearly indicate how sediment will be prevented from entering the BMP during construction.
4. All water quality facilities shall include a separate landscape plan prepared by an experienced professional with a degree or certification that qualifies them to develop the planting palettes and plans. Landscape plans prepared by a professional landscape architect are highly recommended.

70.10.2.4 Channel Protection Storage Volume (CPv)

1. To protect channels from erosion, a 24-hour extended detention of the 1-year, 24-hour storm event will be provided. The rationale for this criterion is that runoff will be stored and released in such a gradual manner that critical erosive velocities during bank-full and near bank-full events will seldom be exceeded in downstream channels. A detention basin or underground vault is normally needed to meet the CPv requirement (and subsequent flood protection criteria, Qp_{10}).

2. CPv shall not be required at sites where the one-year, 24-hour post development peak discharge is less than or equal to 2.0 cfs for the entire development per section 70.10.1.2, #5.

3. As a basis for determining CPv, the following assumptions shall be made:

   a. The model TR-55 (or approved equivalent) shall be used for determining peak discharge rates (see 70.10.2.5, #2 for additional TR-55 information).

   b. The rainfall depth for the one-year, 24 hour storm event shall be obtained from NOAA Atlas 14 (http://hdsc.nws.noaa.gov/hdsc/pfds/) for the specific development location. The rainfall distribution shall be Type II.

   c. The length of overland sheet flow used in time of concentration ($t_c$) calculations shall be limited to no more than 100 feet for post-project conditions.

   d. The 24-hour extended detention is defined as providing a 24-hour detention lag time ($T$) for the one-year storm. The lag time is defined as the interval between the center of mass of the inflow hydrograph and the center of mass of the outflow hydrograph. The lag time and CPv orifice diameter shall be determined by use of nationally recognized pond routing software capable of modelling industry standard methodologies and approved by the Director. The method for computing CPv as outlined in the Maryland Stormwater Design Manual, Appendix D.11 will not be accepted.

   e. A CPv orifice diameter of less than 1½” shall not be allowed. CPv orifice diameters greater than 3” require an acceptable external hood that extends above/below it such as screens, baffles, or as approved by the Director. A CPv orifice diameter between 1½” and 3” shall require internal orifice protection as approved by the Director. An internal orifice protection may include an over-perforated vertical standpipe with ½ inch orifices or slots that are protected by wire cloth and a stone filtering jacket. A schematic design of an acceptable internal orifice protection is provided in Drawing
The preferred method is a submerged reverse-slope pipe that extends downward from the riser to an inflow point one foot below the normal pool elevation.

Alternative methods are to employ a broad-crested rectangular, V-notch, or proportional weir, protected by a half-round pipe or similar device that extends at least 12 inches below the normal pool. (See Drawing Cxxx.xx [Detail No. 7, Appendix D-8 Maryland SW Design Manual/GSM 3.4.3-3.4.5]).

No steel, galvanized steel, or corrugated metal pipe shall be allowed. The use of horizontal perforated pipe protected by geotextile and gravel is not recommended and shall be allowed only by approval of the Director.

Vertical pipes may be used as an alternative if a permanent pool is present.

f. Multiple Drainage Areas: When a development contains or is divided by multiple drainage areas, the entire CPv shall be addressed for each drainage area within that drainage area. The CPv in one facility cannot be increased to compensate for no or reduced CPv in another, except the Director may approve the CPv to be managed elsewhere in the following areas:

i. Where the WQv is treated by widening the riparian buffer and a Sheet Flow to Buffer non-structural BMP credit for WQv is used as described in Section 70.30.1.2.
ii. Where the site constraints do not allow for the effective use of BMPs, such as on remote lots, and the one-year, 24-hour post development peak discharge is less than or equal to 2.0 cfs for the individual drainage area.

Extended detention storage provided for the CPv does not fully meet the WQv requirement (that is CPv and WQv should be treated separately).

The storm water storage needed for CPv may be provided above the WQv storage in storm water ponds and wetlands; thereby meeting all storage criteria in a single facility with appropriate hydraulic control structures for each storage requirement.

The stormwater storage needed for WQv may be nested within the CPv storage in stormwater ponds, wetlands, and bioretention basins where applicable; thereby meeting all storage criteria in a single facility with appropriate hydraulic control structures for each storage requirement.

Infiltration is not recommended for CPv control because of large storage requirements. However, if proven effective, appropriate, and desirable it may be approved by the Director.
70.10.2.5  Flood Protection – Stormwater Detention

1. When required to provide flood protection, developments shall have the following detention requirements:

   a. The post-developed peak flow from the development may not exceed the pre-development peak flow for the 10-year, 24-hour event. In developments where channel protection is not required and flood protection is, the post-developed peak flow from the site may not exceed the pre-development peak flow for the 2-year, 24-hour event and the 10-year, 24-hour event.

   The Department, at its discretion, can create stricter detention standards for watersheds that are known to have storm water management problems. The Engineer shall be made known of any stricter standards during the conceptual design or preliminary plat process.

   b. The pre-development and post-developed peak flows shall be determined using Technical Release 55 (TR-55). All assumptions that are required for the TR-55 method shall be approved, in writing, by the Department prior to commencing clearing or grading activities or approval of an interim grading plan.

   c. For developments less than five (5) acres, the Director may approve the following flood protection standards in place of the standards listed above. The post-developed peak flow from the site may not exceed the existing peak flow for the 15-year, 20-minute event. In developments where channel protection is not required and flood protection is, the post-developed peak flow from the site may not exceed the pre-development peak flow for the 2-year, 20-minute event and the 15-year, 20-minute event. Flow rates shall be determined using the method set forth in section 50.30.1 "Flow Quantities." The 20-minute inflow hydrographs shall be determined as directed in Figure 50-5.

2. The 24-hour inflow hydrographs shall be determined by using Technical Release 55 (TR-55), "Urban Hydrology for Small Watersheds" from the Natural Resources Conservation Service, formerly Soil Conservation Service (SCS). The inflow hydrograph shall be developed based on the actual flow and timing characteristics upstream of the detention facility. The rainfall distribution shall be Type II. Rainfall precipitation data shall be from NOAA Atlas 14 (http://hdsc.nws.noaa.gov/hdsc(pfds/) for the specific development location.

3. Stormwater shall be detained on-site or off-site, as approved by the Director, and released at a rate not to exceed the release rate from the development under pre-development conditions. Note that stormwater pipes, downstream from the control structure, shall be sized to carry the runoff from the 15-year, 20-minute design storm for the total tributary upstream watershed. No reduction in outfall pipe size shall be permitted because of detention.
4. The volume of detention may be provided through permanent detention facilities such as dry basins or ponds, permanent ponds or lakes, underground storage facilities or in parking lots. The Engineer shall make every effort to locate the detention facility at or near the lowest point of the development such that all of the onsite runoff will be directed into the detention facility.

5. Flows from off-site upstream areas shall be by-passed around the detention facility to ensure that the proposed detention facility will function as designed and will provide effective control of downstream flows with development in place. If off-site flows are approved by the Department to be directed into a detention facility, the Engineer shall provide an analysis showing that the detention basin will adequately release storm water under both existing and future developed offsite conditions. Modifying the release rate to accommodate off-site flows may reduce or eliminate the effectiveness of the detention facility, because it will no longer control the increased volume of runoff during the critical time period of the watershed.

6. Detention basin volume shall be based on routing the required post-developed design storm inflow hydrographs through the detention facility while satisfying the appropriate allowable release rate. The routing computations shall be based on an application of the continuity principle, (i.e., level pool routing).

7. Design of Underground Basins:
   
a. Adequate access for basin maintenance and inspection shall be provided. A means of visual inspection from the ground surface of the low flow device, overflow weir and outlet structure shall be required. A manhole shall be provided at the upstream end of underground basins for access, inspection, to facilitate maintenance, and air release. Manhole access shall be provided to allow for cleaning of the low-flow device and isolator row from the ground surface. This access shall be large enough to allow a vacuum truck access to the low-flow device and any isolator row.

b. The basin shall have sufficient volume and spillway capacity to pass/contain the 100-year, 24-hour event.

c. Underground basins shall not be approved for use in residential subdivisions other than multi-family (condominium and apartment) developments where maintenance is provided by a management company.

8. The Engineer must submit the following for review of a detention facility:
   
a. Elevation vs. Discharge tables or curves for all frequencies.

b. Elevation vs. Storage tables or curves for all frequencies.

c. Inflow calculations and data for all frequencies.
d. Hydraulic gradeline computations for pipes entering and leaving the basin for all frequencies.

e. If the embankment contains fill material a geotechnical report may be required.

f. Site plan showing appropriate design information.

g. Structural calculations for the outlet control structures (if required).

h. Cross sections defining size, shape and depth of the detention basin shall be required. At a minimum, three sections, one at each end and one in the middle of the basin shall be required. These sections shall be used to compute the as-built volume of the basin and thus must be tied to a known physical structure or baseline.

9. All ends of pipes and open channels discharging concentrated flow into a dry basin planted with turf grass shall have their outlets stabilized with riprap or other approved erosion control and energy dissipation method and shall be connected with the low-flow pipe or control structure by means of a permeable swale that is lined with a permanent turf reinforcement blanket or an equivalent means of permanent erosion protection. The permeable swale shall have a minimum 1.0 percent and a maximum 2.0 percent longitudinal slope. Longitudinal slopes of up to 4% may be approved by the Director where site conditions justify a greater slope. Permeable swales shall be a minimum of four (4) feet wide or 1.3 times the diameter of the pipe entering the basin, whichever is greater. At a minimum, the permeable swale shall be improved with amended soils per the standards of Section 70.30.1.5. Treatment and credit for WQv shall be allowed for permeable swale designs that incorporate amended soils and an underdrain system that is connected to the basin outlet control structure per standard drawing C604.98. The requirements for the modified soil depth may be waived or reduced by the Director for basins with adequately draining native soils (Hydrologic Soils Group A/B having a minimum infiltration rate of 0.50 inches/hour) provided that there is no further compaction or modification of the native soils during grading and construction of the basin. The bottom of the basin shall be sloped a minimum of two (2) percent towards the permeable swale.

10. All ends of pipes and open channels discharging concentrated flow into a dry basin planted with native vegetation shall have their outlets stabilized with riprap or other approved erosion control and energy dissipation methods. The native vegetation shall be suitable to the hydrologic conditions of the basin and it must be regularly maintained by the owner. A native plant and invasive/non-native plant species list is included in Appendix D of this manual.

11. Where retaining walls are proposed to support an embankment, design elements shall be used to protect the basin from failure and to protect against nuisance to downgradient properties due to seepage or hydrostatic pressure under its ponding conditions. Such design elements shall be supported by recommendations by a Geotechnical Engineer. Railroad tie walls cannot be used.
12. The maximum side slopes for dry basins or ponds, and the fluctuating area of permanent ponds or lakes shall be 3:1 (three feet horizontal, one foot vertical) without fencing.

13. Dry basins shall be lined with placed revetment, seeded turf grass lined with temporary, commercial erosion control blanket or sod that is regularly mowed, or planted with native vegetation that is regularly maintained and is suitable for the hydrologic conditions in the basin.

14. Wet basins and the fluctuating areas of permanent basins, ponds, and lakes shall be lined with placed revetment, sod or seeded turf grass lined with permanent, commercial erosion control blanket that is regularly mowed, or native vegetation that is regularly maintained and suitable for aquatic conditions.

15. Control structures and overflow structures shall be reinforced concrete.

16. The outflow pipe shall be sized for the developed flow rate.

17. In basins with concrete walls or rock blanket covered slopes, provisions shall be made for moving equipment to reach the bottom (ramps, etc.). Retaining walls and any required safety features shall be designed and constructed as regulated by the St. Charles County Building Code Enforcement Division.

18. The design and construction of dams greater than eight (8) feet or as directed by the Department shall be sealed and certified by a Professional Engineer registered in the State of Missouri with demonstrated expertise in geotechnical engineering.

70.10.2.6 Detention Basin Elevation

The low elevation of the detention basin shall be above the 10-year, 24 hour hydraulic elevation of the receiving channel or the 15-year, 20-minute hydraulic elevation of the receiving pipe system. The Director may waive this requirement where site constraints do not allow for a design under free outfall conditions provided that an additional analysis is submitted showing that all detention requirements are achieved under the downstream tailwater conditions.

70.10.2.7 Maximum Depths

1. The maximum depth of water in a dry detention basin or pond shall not exceed six (6) feet. Projects that need a deeper basin to attain the required detention volume due to physical constraints may be evaluated on a case-by-case basis.

2. Permanent detention ponds or lakes shall be designed to minimize fluctuating lake levels. Maximum fluctuation from the permanent pool elevation to the maximum ponding elevation shall be three (3) feet.

3. Parking lots used for automobiles shall have a maximum depth of eight (8) inches of water.
4. Parking lots used for trucks or truck trailers shall have a maximum depth of water of twelve (12) inches.

70.10.2.8 Limits of Maximum Ponding

1. The maximum ponding elevation shall be calculated based on a routing of the 100-year, 24-hour design storm assuming the low flow and any intermediate flow openings are fully blocked with water ponded to the overflow structure sill, unless directed otherwise by the Director.

2. The limits of maximum ponding in dry basins or ponds and permanent lakes or ponds shall not be closer than thirty (30) feet horizontally to any building, and not less than two (2) feet vertically below the lowest sill elevation of any building.

3. The limits of maximum ponding in parking lots shall not be closer than ten (10) feet horizontally from any building and not less than one (1) foot vertically below the lowest sill elevation of any building.

4. A minimum of one (1) foot of freeboard shall be provided from the top of the basin berm or the crest of any emergency spillway to the maximum ponding elevation.

70.10.2.9 Emergency Spillway

An emergency spillway shall be required wherever off site property, infrastructure, or structures exist in the downstream flow path of stormwater that would overflow the basin dam. When required, the emergency spillway shall be designed to pass the 100-year, 24-hour design storm and safely convey any stormwater overflow away from developed areas to a point of stable, natural drainage. The overland flow route shall be depicted on the plan.

70.10.2.10 Dam Permit Requirements

Dams with a height of thirty-five (35) feet or greater, as measured per Publication 2816 by the Missouri Department of Resources, shall require approval from the Missouri Department of Natural Resources.

70.10.3 As-Built Certification for Storm Water Management Facilities

As-built surveys shall be required for all stormwater management facilities. The design engineer shall submit the Professional Engineer’s or Professional Surveyor’s certified as-built drawings and profiles for review and approval by the Department.

Grading and outfall structure opening tolerances should be kept at ± 0.1 foot. In the event that the tolerance requirements are not met, the design engineer shall prepare and submit a revised stormwater management facility design report to demonstrate that the system still meets the performance requirements of these criteria.

70.20 Facility Preservation and Maintenance Requirements
70.20.1 Common Ground Required (Subdivisions)

In subdivisions, the stormwater management facilities, access roads or paths, control structures and outfall pipes shall be located in common ground dedicated to the subdivision trustees. The minimum maintenance access shall be a fifteen (15) foot strip of common ground on which feasible vehicular access shall be constructed by the developer. Placement and preservation of facilities outside of common ground will be considered on case-by-case basis and approved by the Director of Community Development. Justification must be provided for consideration. The preservation of non-structural BMPs in easements on private property in subdivisions with minimum three (3) acre lot sizes shall be approved.

70.20.2 Easements/Deed Restricted Areas Required (Non-subdivisions/Commercial Sites)

In non-residential (commercial/industrial) developments other than those in commercial subdivisions, stormwater management facilities, including control structures and outfall pipes, shall be located in easements or deed restricted areas that preserve the facility in perpetuity.

70.20.3 Maintenance Requirements

70.20.3.1 Maintenance Responsibility

The County shall not be responsible for maintenance of the stormwater management facilities. Stormwater management facilities shall be maintained by the subdivision homeowners or the property owner. Periodic maintenance shall be required of the facility owners per the approved maintenance plan and Section 420.020 of the Unified Development Ordinance. No modifications shall be made to the facilities without approval or a permit from the County.

70.20.3.2 Maintenance Agreement - Subdivision Development

The responsibility and funding for stormwater management facilities maintenance shall be addressed in the subdivision trust indentures. A maintenance plan and schedule for all stormwater management facilities shall be established by the subdivision developer, approved by the Director, recorded, and referenced and enforced in the subdivision trust indentures.

70.20.3.3 Maintenance Agreement - Non-Subdivision Development (Commercial & Industrial Developments)

Prior to the closure of a land disturbance permit for an approved commercial site plan, the property owner(s) of any stormwater management facility shall execute a Development Restrictions and Maintenance Agreement to ensure that the facilities are preserved, maintained, and kept in working order to the satisfaction of the County and per Section 420.020 of the Unified Development Ordinance. An exhibit of the restricted area(s) and a maintenance plan and schedule shall be developed by the property owner(s) or developer(s), approved by the Director, and made a part of the Development Restrictions and Maintenance Agreement. The Agreement shall be recorded and the cost of recording the document shall be paid by or recovered from the owner or developer of the
development. A Development Restrictions and Maintenance Agreement form can be found in Appendix A of this manual.

**70.30 Design Guidelines For Post-Construction Stormwater Management BMPs**

This section furnishes design guidelines to provide the engineer a flexible tool to select and design appropriate structural and non-structural methods to mitigate stormwater runoff impacts caused by urban development and land use in St. Charles County. Standard drawings for structural post-construction stormwater management measures are included in Appendix F.

This section is not intended to be the sole source regarding acceptable post-construction stormwater management methods:

1. Engineering professionals are encouraged to design innovative ways to address site specific conditions, including the use of available on-site, native, recyclable materials and manufactured technology.

2. Post-construction stormwater management design methods and BMPs from municipalities within St. Charles County and the St. Louis Metropolitan Sewer District that are compliant with state and federal water quality standard requirements may be substituted.

3. Design methods and BMPs from regional planning, state, and federal agencies that have similar hydrology, soils, and geologic conditions with the development and that are compliant with state and federal water quality standard requirements may be substituted, including the Georgia Stormwater Manual, the M.A.R.C. Manual, and the Maryland Stormwater Design Manual.

4. The substitution of design methods and BMPs shall not apply to the easement, ownership, and maintenance requirements of the County. It shall only apply to methodology and best management practices for post-construction stormwater quality to allow greater flexibility in compliant design.

5. Alternative post-construction stormwater management methods shall be reviewed with the Director and alternative design criteria shall be approved for use by the Director during the preliminary/conceptual design stage of the project. Alternative post-construction stormwater management methods shall only be considered when the methods proposed meet the design standards in Section 70.10.2 and support the purpose statements in Section 70.00.1.

**70.30.1 Non-Structural BMPs/Credits**

Development projects can be designed to reduce their impact on watersheds when careful efforts are made to conserve natural areas, reduce impervious cover and better integrate stormwater treatment. By implementing a combination of these non-structural approaches, collectively known as better site design methods, it is possible to reduce the amount of runoff and pollutants that are generated from a development and provide for some non-structural on-site treatment and control of runoff.

Non-structural BMPs are increasingly recognized as a critical feature of stormwater BMP plans, particularly with respect to site design. In most cases, non-structural BMPs will be combined with structural BMPs to meet all stormwater volume requirements. The key benefit
of non-structural BMPs is that they can reduce the generation of stormwater from the development, thereby reducing the size and cost of structural BMPs. In addition, they can provide partial removal of many nutrients and pollutants. The non-structural BMPs have been classified into eight (8) broad categories. To promote greater use of non-structural BMPs, a series of credits and incentives are provided for developments that use these progressive, conservation site planning techniques. The credits for RRv, WQv, CPv, Qp, and CN adjustment are summarized in Table 70-3.

Site designers are encouraged to utilize as many credits as they can on a site. Greater reductions in stormwater storage volumes can be achieved when many credits are combined (e.g., disconnecting rooftops and protecting natural conservation areas). However, credits cannot be claimed twice for an identical area of the site (e.g. claiming credit for stream buffers and disconnecting rooftops over the same site area).

<table>
<thead>
<tr>
<th>Stormwater Credit</th>
<th>RRv</th>
<th>WQv</th>
<th>CPv or Qp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Area Conservation</td>
<td>None</td>
<td>Reduce Site Area</td>
<td>Woods-good or Meadow CN for natural areas</td>
</tr>
<tr>
<td>Sheet Flow to Buffer</td>
<td>None</td>
<td>Subtract contributing site area to BMP</td>
<td>Woods-good CN for contributing areas</td>
</tr>
<tr>
<td>Site Reforestation (Canopy)/Revegetation (Native Planting)</td>
<td>Reduce Site Area by 50% of reforested area¹</td>
<td>Reduce Site Area by 50% of reforested area¹</td>
<td>Woods-fair or Meadow CN for restored areas²</td>
</tr>
<tr>
<td>Soil Restoration (Amendments)</td>
<td>Reduce Site Area by 50% of soil restoration area¹</td>
<td>Reduce Site Area by 50% of soil restoration area¹</td>
<td>Open space - good CN for restored areas</td>
</tr>
<tr>
<td>Disconnection of Rooftop Runoff</td>
<td>A/B or Amended Soils - RRv reduced 50% C/D Soils – RRv reduced 25%</td>
<td>Reduced Rv</td>
<td>Longer t_c (increased flow path) CN Adjustment per 70.30.1.10</td>
</tr>
<tr>
<td>Disconnection of Non-Rooftop Impervious Area Runoff</td>
<td>A/B or Amended Soils - RRv reduced 50% C/D Soils – RRv reduced 25%</td>
<td>Reduced Rv</td>
<td>Longer t_c (increased flow path) CN Adjustment per 70.30.1.10</td>
</tr>
<tr>
<td>Open Channel Design</td>
<td>A/B or Amended Soils - RRv reduced 25% C/D Soils – RRv reduced 10%</td>
<td>May meet WQv</td>
<td>Longer t_c (increased flow path) No CN Credit</td>
</tr>
<tr>
<td>Environmentally Sensitive Development</td>
<td>None</td>
<td>Meets WQv</td>
<td>No CN credit - t_c may increase</td>
</tr>
</tbody>
</table>

¹ Site area reduction does not apply to rooftop impervious areas.
1 Reduce Site Area by 100% of reforested area if combined with soil restoration practices/credits (Section 70.30.1.4).

2 Woods-good or Meadow CN for restored areas if combined with soil restoration practices/credits (Section 70.30.1.4).

70.30.1.1 Natural Area Conservation

A stormwater credit can be taken when undisturbed natural areas are conserved on a site, thereby retaining their pre-development hydrologic and water quality characteristics. Under this credit, a designer can subtract conservation areas from total site area when computing water quality volume requirements.

An added benefit will be that the post-development peak discharges will be smaller, and hence water quantity control volumes \((CPv, Qp_{10} \text{ and } Qp_{100})\) will be reduced due to lower post-development curve numbers. The post development curve number \((CN)\) used to compute the \(Cpv\) and \(Qp\) for all wooded natural areas protected by conservation easements can be assumed to be “Woods - good condition” when calculating the total site \(CN\). The post development curve numbers \((CN)\) used to compute the \(Cpv\) and \(Qp\) for all non-wooded natural areas protected by conservation easements can be assumed to be “Meadow – continuous grass, protected from grazing and generally mowed for hay” when calculating the total site \(CN\).

The following criteria shall apply in order to receive the credit:

1. Conservation area cannot be disturbed during project construction and shall be protected by limits of disturbance clearly shown on all construction drawings. To help create contiguous, interconnected green infrastructure corridors on development sites, site planning and design teams should strive to connect reforested or revegetated areas with one another and with other primary and secondary conservation areas through the use of nature trails, bike trails and other “greenway” areas.

2. Proposed areas shall be located within an acceptable conservation easement instrument that ensures perpetual protection per Section 70.20. The easement must clearly delineate the boundary limits and specify how the natural area vegetation shall be managed and boundaries will be marked. [Note: managed turf (e.g., playgrounds, regularly maintained open areas) is not an acceptable form of vegetation management]

3. Conservation areas have a minimum contiguous area requirement of 10,000 square feet.

EXAMPLE:

Residential Subdivision
Area = 38 acres
Natural Conservation Area = 7 acres
Impervious Area = 13.8 acres

\[ R_v = 0.05 + 0.009 \times (I) = 0.05 + 0.009 \times (36.3\%) = 0.37 \]
(Rv kept constant when calculating WQv)

Credit:
7.0 acres in natural conservation area
New drainage area = 38 – 7 = 31 acres

Before credit:
\[ WQ_v = (1.14)(0.37)(38)/12 = 1.34 \text{ ac-ft} \]

With credit:
\[ WQ_v = (1.14)(0.37)(31)/12 = 1.09 \text{ ac-ft} \]

(19% reduction in water quality volume)

70.30.1.2 Sheet Flow to Buffer
This credit is given when stormwater runoff is effectively treated by a natural buffer to a stream. Effective treatment is achieved when pervious and impervious area runoff is discharged to a grassed, native or forested stream buffer through overland flow. The use of a filter strip or a level-spreader is also recommended to treat overland flow in the green space of a development site. The area draining by sheet flow to a stream buffer is subtracted from the total site area in the WQv calculation. A CN for “Woods - good condition” can be used for the contributing area if it drains to a forested buffer.

The following criteria shall apply in order to receive the credit:

1. The minimum buffer width shall be 50 feet as measured from the top of bank of the watercourse.

2. The maximum contributing length shall be 150 feet for pervious surfaces and 75 feet for impervious surfaces.

3. Runoff shall enter the buffer as sheet flow. Either the average contributing overland slope shall be 5.0% or less, or a level spreading device shall be used where sheet flow can no longer be maintained (see Details ESC-24 and ESC-25).

4. Not applicable if rooftop or non-rooftop disconnection is already provided (see Sections 70.30.1.5 and 70.30.1.6).

5. The buffer width shall be preserved and maintained per the requirements of Section 405, Article VI of the Unified Development Ordinance.

6. If any of the preserved buffer width must be re-established, the buffer plans must clearly specify how the natural area vegetation shall be established and managed and
how preservation boundaries will be marked [Note: managed turf (e.g. playgrounds, regularly maintained open areas) is not an acceptable form of vegetation management].

Figure 70.1 illustrates how a stream buffer or filter strip can be used to treat stormwater from adjacent pervious and impervious areas.

Figure 70.1 Example of Stream Buffer Credit Option

70.30.1.3 Site Reforestation (Canopy)/Revegetation (Native Planting)

Site reforestation/revegetation refers to the process of planting trees, shrubs and other native vegetation in disturbed pervious areas to restore them to their pre-development conditions. The process can be used to help establish mature native plant communities (e.g., forests) in pervious areas that have been disturbed by clearing, grading and other land disturbing activities.

The Center for Watershed Protection (Hirschman et al., 2008) documented the ability of the site reforestation/revegetation process to reduce annual stormwater runoff volumes and pollutant loads on development sites. Consequently, this low impact development practice can be used to help satisfy the reduce runoff volume and provide water quality improvements:

- **Runoff Reduction** - Site reforestation/revegetation is an effective low impact development (LID) practice that can reduce post-construction stormwater runoff and improve water quality. When used to improve site areas and create conservation amenities; runoff reduction, lower post-developed flow rates, and lower discharge velocities are all benefits of reforestation or revegetation. Subtract 50% of any reforested/revegetated areas from the total site area and re-calculate the runoff reduction volume (RRv) that applies to the development site.

- **Water Quality Protection** - Site reforestation and/or revegetation helps restore pre-development hydrology, which implicitly reduces post-construction stormwater runoff rates in addition to runoff volumes and pollutant loads. Subtract 50% of any reforested/revegetated areas from the total site area and re-calculate the water quality volume (WQv) that applies to the development site.

- **Channel Protection and Overbank and Extreme Flood Protection** - Assume that the post-development hydrologic conditions of any reforested/revegetated areas are equivalent to those of a similar cover type (e.g., meadow, brush, woods) in fair condition.

If site reforestation/revegetation can be combined with soil restoration (Section 70.30.1.4) on a development site, the following stormwater management benefits and incentives are available to help satisfy the requirements presented in this manual:
• Runoff Reduction - Subtract 100% of any restored and reforested/revegetated areas from the total site area and re-calculate the runoff reduction volume (RRv) that applies to the development site.

• Water Quality Protection - Subtract 100% of any restored and reforested/revegetated areas from the total site area and re-calculate the water quality volume (WQv) that applies to the development site.

• Channel Protection and Overbank and Extreme Flood Protection - Assume that the post-development hydrologic conditions of any restored and reforested/revegetated areas are equivalent to those of a similar cover type (e.g., meadow, brush, woods) in good condition.

The following criteria shall apply in order to receive the credit:

1. Reforested/revegetated areas shall have a minimum contiguous area requirement of 10,000 square feet. To help create contiguous, interconnected green infrastructure corridors on development sites, site planning and design teams should strive to connect reforested or revegetated areas with one another and with other primary and secondary conservation areas through the use of nature trails, bike trails and other “greenway” areas.

2. Areas that have been reforested or revegetated shall be maintained in an undisturbed, natural state over time. A long-term vegetation management plan shall be developed and approved by the Department for all reforested/revegetated areas. The plan shall clearly specify how the area will be maintained in an undisturbed, natural state over time, how invasive/non-native plants will be managed, and include a method for watering and care during plant establishment period of one to two years. The reforested/revegetated areas shall be designated as conservation areas and protected in perpetuity per the requirements in Sections 70.20.1 and 70.20.3.

3. Maximum 25% slope in the disturbed pervious area to be reforested/revegetated.

4. Soils need to be capable of sustaining the vegetation proposed which may require significant amendments. A soil test shall be performed to determine what type of vegetation can be supported by the soils in the area to be reforested/revegetated and/or what soil amendments will be required.

5. A landscaping plan shall be prepared by a qualified licensed professional for all reforested/revegetated areas. The landscaping plan shall be reviewed and approved by the Department prior to construction. Managed turf cannot be used to landscape reforested/revegetated areas. A native plant and invasive/non-native plant species list is included in Appendix D of this manual.

6. Methods used for site reforestation/revegetation shall achieve at least 75 percent vegetative cover two (2) years after installation.
70.30.1.4 Soil Restoration (Amendments)

Soil restoration refers to the process of tilling and adding compost and other amendments to soils to restore them to their pre-development conditions, which improves their ability to reduce post-construction stormwater runoff rates, volumes and pollutant loads. The soil restoration process can be used to improve the hydrologic conditions of pervious areas that have been disturbed by clearing, grading and other land disturbing activities. It is ideal for use on lawns and other pervious areas that have been disturbed by clearing, grading and other land disturbing activities.

Soil restoration can also be used to increase the stormwater management benefits provided by other low impact development practices, such as site reforestation/revegetation (Section 70.30.1.3), vegetated filter strips (Section 70.40.X), grass channels (Section 70.40.X) and simple downspout disconnection (Section 70.30.1.5), on sites that have soils with low permeabilities (i.e., hydrologic soil group C or D soils). The soil restoration process can be used to help increase soil porosity and improve soil infiltration rates on these sites, which improves the ability of these and other low impact development practices to reduce post-construction stormwater runoff rates, volumes and pollutant loads.

- Runoff Reduction - Soil restoration is one of the most effective low impact development (LID) practices that can be combined with other BMPs to reduce post-construction stormwater runoff and improve runoff quality. Like other LID practices, soil restoration becomes more effective the higher the infiltration rate increases. When used to improve native soils when paired with another BMP, runoff reduction percentages can increase from 15 to 25 percent. Subtract 50% of any restored pervious areas from the total site area and re-calculate the runoff reduction volume (RRv) that applies to the development site.

- Water Quality Protection - Due to the soil amendments themselves, in addition to the runoff reduction benefits, soil restoration inherently improves water quality. Depending on the organic compounds and other amendments added, nutrient uptake and other pollutant removal processes can be achieved. Subtract 50% of any restored pervious areas from the total site area and recalculate the water quality volume (WQv) that applies to the development site.

- Channel Protection and Overbank and Extreme Flood Protection - Soil restoration helps restore pre-development hydrology, which implicitly reduces post-construction stormwater runoff rates in addition to runoff volumes and pollutant loads. Assume that the post-development hydrologic conditions of any restored pervious areas are equivalent to those of open space (e.g., lawns, parks, golf courses) in good condition.

The following criteria shall apply in order to receive the credit:

1. Credit shall be limited to pervious areas that have soils with low permeabilities (i.e. hydrologic soil group C or D soils) or that have been disturbed and compacted by land disturbing activities. Areas that have permeable soils (i.e. hydrologic soil group A or B
soils) that have not been disturbed by land disturbing activities do not need to be restored and shall not be eligible for the credit.

2. Maximum 10% slope in the disturbed pervious area to be restored.

3. To properly restore disturbed pervious areas, soil amendments shall be added to existing soils to a minimum depth of 18 inches until an organic matter content of 8% to 12% is obtained. Depths greater than 18” shall be amended when shrubs or trees are being installed. Compost shall be incorporated into existing soils, using a rototiller or similar equipment, to a depth of 18 inches and at an application rate necessary to obtain a final average organic matter content of 8%-12%. Required application rates can be determined using a compost calculator, such as the one provided on the following website: http://www.soilsforsalmon.org/how. A summary sheet and the Building Soil Manual are also available to use as resources. Other calculations are available online.

4. Only well-aged composts that have been composted for a period of at least one year shall be used to amend existing soils. Composts shall be stable and show no signs of further decomposition. Composts used to amend existing soils shall meet the following specifications (most compost suppliers will be able to provide this information):
   - Organic Content Matter: Composts shall contain 35%-65% organic matter.
   - Moisture Content: Composts shall have a moisture content of 40%-60%.
   - Bulk Density: Composts shall have an “asis” bulk density of 40-50 pounds per cubic foot (lb/ft³). In composts that have a moisture content of 40%-60%, this equates to a bulk density range of 450-800 pounds per cubic yard (lb/cy), by dry weight.
   - Carbon to Nitrogen (C:N) Ratio: Composts shall have a C:N Ratio of less than 25:1.
   - pH: Composts shall have a pH of 6-8.
   - Cation Exchange Capacity (CEC): Composts shall have a CEC that exceeds 50 milliequivalents (meq) per 100 grams of dry weight.
   - Foreign Material Content: Composts shall contain less than 0.5% foreign materials (e.g., glass, plastic), by weight.
   - Pesticide Content: Composts shall be pesticide free.

5. To help prevent soil erosion, landscaping shall be installed immediately after the soil restoration process is complete. Simple erosion and sediment control measures, such as temporary seeding and erosion control mats, should be used on restored pervious areas that exceed 2,500 square feet in size. If the restored pervious areas will “receive” any stormwater runoff from other portions of the development site, measures should be
taken (e.g., silt fence, temporary diversion berm) to prevent it from compromising the soil restoration effort.

6. To avoid damaging existing root systems, soil restoration shall not be performed in areas that fall within the drip line of existing trees.

7. Heavy vehicular and foot traffic shall be kept out of all restored pervious areas during and after construction. This can typically be accomplished by clearly delineating soil restoration areas on all development plans and, if necessary, protecting them with temporary construction fencing.

70.30.1.5 Disconnection of Rooftop Runoff

A credit is given when rooftop runoff is disconnected and then directed to a pervious area where it can either infiltrate into the soil or filter over it. If properly designed, downspout disconnects can provide measurable reductions in post-construction stormwater runoff rates, volumes and pollutant loads on development sites. The primary concerns associated with a downspout disconnect are the length of the flow path over the lawn, landscaping, or other pervious area below the disconnection point and the permeability of those soils. If a rooftop is adequately disconnected, the following credits can be obtained:

- **Runoff Reduction** - The runoff reduction volume (RRv) conveyed through a downspout disconnect located on hydrologic soil group (HSG) A/B or soils amended per Section 70.30.1.4 is reduced by 50%. Reduce the RRv conveyed through a downspout disconnect located on HSG C/D soils or any type soils that were graded and compacted during development by 25%.

- **Water Quality Protection** - If installed as per the design criteria and properly maintained, 80% total suspended solids removal will be applied to the water quality volume (WQv) flowing to the disconnected downspout. Therefore, the disconnected impervious area can be deducted from total impervious cover in the WQv calculation.

- **Channel Protection and Overbank and Extreme Flood Protection** – Proportionally adjust the post-development runoff CN to account for the runoff reduction provided by a downspout disconnect for the contributing drainage area per 70.30.1.10.

The following criteria shall apply in order to receive the credit:

1. This credit is only allowed for residential subdivision developments with minimum one-acre lot sizes and commercial/industrial developments.

2. Disconnections shall only be credited for lot sizes greater than 6000 sq. ft.

3. Disconnects shall be designed to convey stormwater runoff away from buildings to prevent damage to building foundations and to ensure no basement seepage.
4. The maximum contributing area of rooftop to a disconnected discharge shall be 2,500 square feet.

5. Rooftop runoff shall enter the disconnected area as sheet flow to ensure proper pollutant removal (this will require the use of splash pads/blocks or other approved level-spreading or energy dissipating device). The minimum length of the flow path in the pervious areas below the "disconnection" shall be equal to or greater than the length of the flow path in the contributing drainage area and a minimum of 15 ft.

6. The slope of the pervious area below the disconnection shall be a maximum of 6% and a minimum of 0.5% (1% to 5% is recommended).

7. The disconnection must drain continuously through a pervious area, vegetated channel, swale, or through a filter strip to the property line or BMP. Disconnected stormwater runoff shall not be allowed to “reconnect”, or flow across impervious areas, before reaching a downstream BMP or being discharged off-site.

8. Downspouts must be at least 10 feet away from the nearest impervious surface or storm sewer pipe system to discourage "re-connections.”

9. For those rooftops draining directly to a buffer, only the rooftop disconnection credit or the buffer credit can be used, not both.

70.30.1.6 Disconnection of Non-Rooftop Impervious Area Runoff

Credit is given for practices that disconnect surface impervious cover runoff by directing it to pervious areas where it is either infiltrated into the soil or filtered (by overland flow). This credit can be obtained by grading the site to promote overland vegetative filtering or providing bioretention areas. If an impervious area is adequately disconnected, the following credits can be obtained:

- Runoff Reduction - The runoff reduction volume (RRv) conveyed through an impervious area disconnect located on hydrologic soil group (HSG) A/B or soils amended per Section 70.30.1.4 is reduced by 50%. Reduce the RRv conveyed through an impervious area disconnect located on HSG C/D soils or any type soils that were graded and compacted during development by 25%.

- Water Quality Protection - If installed as per the design criteria and properly maintained, 80% total suspended solids removal will be applied to the water quality volume (WQv) flowing to the disconnected impervious area. Therefore, the disconnected impervious area can be deducted from total impervious cover in the WQv calculation.

- Channel Protection and Overbank and Extreme Flood Protection – Proportionally adjust the post-development runoff CN to account for the runoff reduction provided by an impervious area disconnect for the contributing drainage area per 70.30.1.10.
The following criteria shall apply in order to receive the credit:

1. This credit is only allowed on residential subdivision developments with minimum one-acre lot sizes and commercial/industrial developments.

2. The maximum contributing impervious flow path length shall be 75 feet.

3. The disconnection must drain continuously through a vegetated channel, swale, or filter strip to the property line or BMP.

4. The length of the "disconnection" must be equal to or greater than the contributing length.

5. The entire vegetative "disconnection" shall be on an average slope of 5% or less.

6. The surface imperviousness area to any one discharge location cannot exceed 1,000 sq. ft.

7. Disconnections are encouraged on relatively permeable soils (HSG’s A and B).

8. For those areas draining directly to a buffer, only the non-rooftop disconnection credit or the buffer credit can be used, not both.

70.30.1.7 Open Channel Design

Credit may be given when open grass channels are used to reduce the volume of runoff and pollutants during smaller storms (e.g., < 1 inch). The schematic of the grass channel is provided in Figure 70.2. If designed according to the following criteria, the following credits can be obtained:

- **Runoff Reduction** – Like other LID practices, grass channels become more effective with higher infiltration rates of native soils. A grass channel can be designed to provide 25% of the runoff reduction volume for type A and B hydrologic soils or 10% of the runoff reduction volume for type C and D hydrologic soils.

- **Water Quality Protection** – the grass channel will meet the WQv.

- **Channel Protection and Overbank and Extreme Flood Protection** – CNs for channel protection (Cpv) and peak flow control (Qp) will not change.

The following criteria shall apply in order to receive the credit:

1. The maximum flow velocity for runoff from the water quality rainfall event (1.14”) shall be less than or equal to 1.0 fps and the flow depth shall not exceed four (4) inches. [see Appendix D-10 MSWDM for methodology to compute flowrate]
2. The maximum flow velocity for runoff from the 15-year, 20-minute design event shall be non-erosive (2 fps or less).

3. The bottom width shall be 2 feet minimum and 8 feet maximum.

4. The side slopes shall be 3:1 or flatter.

5. The channel slope shall be less than or equal to 4.0% (1.0 - 2.0% recommended).

6. Not applicable if rooftop and/or non-roof-top disconnection is already provided (see 70.30.1.5 and 70.30.1.6).

7. In addition to the requirements above, Grass Channels shall meet the requirements of Engineered Channels in Section 50.30.5.

An example of a grass channel is provided in Figure 70.2.

**Figure 70.2   Example of Grass Channel**

[INSERT FIGURE]

**70.30.1.8   Environmentally Sensitive Development (LID)**

Credit is given when a group of environmental site design techniques are applied to low density and cluster residential development. The credit eliminates the need for structural practices to treat the WQv and is intended for use on large or clustered lots.

WQv can be met without the use of structural practices in certain low density residential developments when the following conditions are met:

1. Total subdivision impervious cover is less than 15%.

2. Minimum lot size must be at least one acre.

3. Rooftop runoff is disconnected in accordance with the criteria outlined under Section 70.30.1.5.

4. Grass channels are used to convey runoff versus curb and gutter.

5. Stormwater runoff is discharged into BMPs or preserved soil conservation features before being discharged to natural drainageways.

WQv can be met without the use of structural practices in cluster residential developments when the following conditions are met:

1. Total site impervious cover is less than 15%.
2. The average lot density shall not be greater than one acre.

3. Rooftop runoff is disconnected in accordance with the criteria outlined under Section 70.30.1.5.

4. Grass channels are used to convey runoff versus curb and gutter.

5. A minimum of 25% of the subdivision is protected in natural conservation areas (by common ground, permanent easement, or other similar measure).

6. The design shall address stormwater (WQv, Cpv and/or Qp) for all roadway and connected impervious surfaces.

70.30.1.9 Impervious Cover Reduction
This is not a credit, per se, but it is a means of reducing the WQv, Cpv, and Qp.

70.30.1.10 ADJUSTED CN PROCEDURE FOR PEAK FLOW REDUCTION
The following method utilizes the Natural Resource Conservation Service runoff equations originally provided in Urban Hydrology for Small Watersheds (USDA 1986) to compute a curve number adjustment that effectively reduces the peak flow of other storm events. A simplified approach has been provided that combines these runoff equations. The following modified equation is discussed in the 2010 Center for Watershed Protection journal article titled, The Runoff Reduction Method:

\[ Q - R = \frac{(P - 0.2S)^2}{(P + 0.8S)} \]  
(Equation 70.1)

Where:

- \( Q \) = runoff depth (in),
- \( P \) = rainfall depth (in),
- \( Ia \) = Initial abstraction (in),
- \( S \) = potential maximum retention after runoff begins (in),
- \( CN \) = Runoff Curve Number, and
- \( R \) = Retention storage provided by runoff reduction practices (in).

To calculate “\( R \)”, the provided RRv of the practice(s) can be calculated by the following:

\[ R = \frac{(VP)(RR\%)}{Area} \]

Where:

- \( VP \) = Total Volume Provided by the BMP
- \( RR\% \) = runoff reduction credit provided by the BMP (See Table 70.X for RR\%)
By solving the modified equation above for a new potential maximum retention value, S, the adjusted curve number can be back calculated as a representation of the runoff reduction achieved in any particular storm event.

**Runoff Reduction/Adjusted Curve Number Example**

Using the given data and information provided below, calculate the runoff reduction volume and the adjusted curve number for channel protection assuming a best management practice is used that provides a runoff reduction removal percentage (RR%) of 50%.

**Given Information:**

- Site Area: 3.0 ac (130,680 ft²)
- Impervious Area: 1.9 ac; or I=1.9/3.0 = 63.3%
- Pre-developed CN: 70
- Post-developed CN: 88
- P₁YR: 3.4 inches
- S: 1.36 \((1000/CN-10)\)
- Post-\(Q₁YR\): 2.18 inches (See Equation 70.1)

**Calculate water runoff reduction volume (RRv)**

Compute volumetric runoff coefficient, \(R_v\)

\[
R_v = 0.05 + (0.009)(I)
\]

\[
= 0.05 + (0.009)(1.9/3 \times 100\%)
\]

\[
= 0.62
\]

Compute runoff reduction volume, \(RRv\)

\[
RRv = 0.9(R_v)(A)/12
\]

\[
= 0.9(0.62)(3)/12
\]

\[
= 0.140 \text{ acre-feet (6,077 cubic feet)}
\]

*Note: The Volume Provided (VP) of this practice must be a minimum of 12,154 ft³.*

**Calculate the amount of Runoff Reduction (RRv provided) by the practice. This information will be needed in the adjusted curve number calculation (converted to the variable “R”):**

\[
RRv \text{ (provided)} = (RR\%) \times (VP)
\]

\[
= (50\%) \times (12,154 \text{ ft}^3)
\]

\[
= 6,077 \text{ ft}^3
\]

**Adjusted Curve Number Procedure for Peak Flow Reduction of CPv**
Given $Q = 2.18$ in. and $P = 3.4$ in., Find “R” and “S” to back calculate an adjusted CN

$$Q - R = \frac{(P - 0.2S)^2}{(P + 0.8S)} \quad \text{(Equation 70.1)}$$

Retention storage (expressed in inches) for this basin is calculated by the following formula:

$$R = \frac{R_{Rv} \text{ (provided)}}{\text{Basin Area}} = \frac{(6,077 \text{ ft}^3)}{6,077 \text{ ft}^3 / 130,680 \text{ ft}^2 (12 \text{ in} / 1 \text{ ft})} = 0.56 \text{ inches}$$

Solve for “S” to back calculate CN: $S = 2.36$

$S = \frac{1000}{\text{CN}} - 10$: therefore, Adjusted CN = 80.9

### 70.30.2 Acceptable Urban BMPs

Structural best management practices should be considered after all reasonable attempts have been made to minimize stormwater runoff and maximize its control and treatment through better site design methods and use of natural features and non-structural BMPs.

This section sets forth five acceptable groups of BMPs that can be used to meet the WQv. The design and selection of these BMPs shall generally conform to the criteria contained in Section 70.40 or as outlined in Section 70.30, #1-5. Acceptable uses of the BMPs are summarized in Table 70-X and Physical Feasibility Factors are summarized in Table 70-X. Details for each BMP design are provided in Sections 70.40 or 99.

1. A combination of BMPs and/or credits is normally required at most developments to meet all three storm water sizing criteria.

2. The following proprietary BMPs are approved for use in St. Charles County:
   - MSD Approved Products and Suppliers: Structural Proprietary BMPs
   - Mid-America Regional Council (M.A.R.C.)
   - Vortex Structures & Filtration Technology designed/manufactured by [Hydro International](#) and [Contech Engineered Solutions](#)

Other proprietary BMPs may be approved by the Director provided that the BMP meets the guidelines established in this section or it has been approved for use by other local MS4 municipalities or agencies that are compliant with state and federal water quality standard requirements.

New structural BMP designs are continually being developed, including many proprietary designs. To be considered an effective BMP for stand-alone treatment of WQv, current or new BMP design variants cannot be accepted for inclusion on the list until independent pollutant removal performance and monitoring data determine that the BMP can meet the following:
a. Capturing and treating the required RRv or WQv,
b. Reducing the average total load of suspended solids (TSS) by 80%, and,
c. Having an acceptable level of maintenance and longevity rate in the field.

70.30.2.1 Stormwater Ponds
Practices that have a combination of permanent pool, extended detention or shallow wetland equivalent to the entire WQv include:

- P-1 Micropool Extended Detention (ED) Pond
- P-2 Wet Pond
- P-3 Wet Extended Detention Pond
- P-4 Multiple Pond System
- P-5 Pocket Ponds

70.30.2.2 Stormwater Wetlands
Practices that include significant shallow wetland areas to treat urban stormwater but often may also incorporate small, permanent pools and/or extended detention storage to achieve the full WQv include:

- W-1 Shallow Wetland
- W-2 ED Shallow Wetland
- W-3 Pond/Wetland System
- W-4 Pocket Wetland

Wetlands may be used for WQv and CPv but shall not be used for control of the flood protection volumes (Qp10/100). Wetlands shall be designed by a professional with a degree or certification that qualifies them to design wetlands.

70.30.2.3 Infiltration Practices
Practices that capture and temporarily store the WQv before allowing it to infiltrate into the soil over a two-day period include:

- I-1 Infiltration Trench
- I-2 Infiltration Basin

Infiltration practices will be allowed on developments where it is proven that infiltration can be affectively achieved. Developments that are susceptible to prolonged flooding and sediment deposition or that are within high water tables shall not be approved for infiltration practices. Soil reports shall be required to determine the suitability of infiltration practices.

70.30.2.4 Filtering Practices
Practices that capture and temporarily store the WQv and pass it through a filter bed of
sand, inorganic matter, soil, or other media. Filtered runoff may be collected and returned to the conveyance system. Practices include:

F-1 Surface Sand Filter
F-2 Underground Sand Filter (restricted use – see below)
F-3 Perimeter Sand Filter
F-4 Organic Filter
F-5 Pocket Sand Filter
F-6 Bioretention (see below)
F-7 Nested Basin (Combination Bioretention & Detention Basin)

F-2 shall not be allowed on residential developments. F-6 may be used for infiltration where the underlying soils allow for infiltration and the BMP is designed with no underdrain. Soil reports shall be required to determine the suitability of infiltration practices. Developments that are susceptible to prolonged flooding and sediment deposition or that are within high water tables shall not be approved for filtering practices.

70.30.2.5 Open Channel Practices

Vegetated open channels that are explicitly designed to capture and treat the full WQv within the dry or wet cells formed by check dams or other means. Practices include:

O-1 Dry Swale (restricted use – see below)
O-2 Wet Swale (restricted use – see below)
O-3 Vegetated Filter Strips

Open channel BMPs are different than engineered channels used for traditional stormwater conveyance. Open channel practices shall be designed with the proper plantings. Open channel practices are not allowed on single-family residential projects with the exception that dry swales are allowed on common ground. Open channel practices are allowed on multi-family residential projects only where maintenance is provided by a property management company.

70.40 Urban BMP Design Guidelines [USE GSM & PFT STUDY FOR MSD]

**ADD NATIVE PLANT LIST FOR BASIN DESIGN & INVASIVE/NON-NATIVE SPECIES LIST IN APPENDIX D **

**BMP STANDARD DESIGNS TO BE REVIEWED BY TECHNICAL PEER/STAKEHOLDER GROUP **
Detention Basin Permeable Swale

2% SLOPE TOWARD THE PILOT SWALE

PERMEABLE SWALE
NOT TO SCALE

18" PLANTING SOIL LAYER

2% SLOPE TOWARD THE PILOT SWALE

PERMEABLE SWALE WITH UNDERDRAIN
NOT TO SCALE

12" PLANTING SOIL LAYER

4" DIAMETER PERFORATED SCHEDULE 40 PVC UNDERDRAIN PIPE. SINGLE SIDED 3/8" PERFORATIONS ON 6" CENTERS, WITH PERFORATED SIDE LAD DOWN IN PIPE TRENCH.

4 3/4" CLEAN GRAVEL AASHO M-43 #6 OR 67

ALL GRAVEL TO BE NATURAL AND UNCRUSHED

Planted Soil Specifications:
Sandy Loam or Loamy Sand should contain a minimum of 35 to 60 percent sand, by volume. The clay content for these soils should be less than 10 percent by volume. The soil shall be free of stones, stumps, roots, or other woody material over 1 inch in diameter. Placement of the planting soil should be in lifts of 12 to 18 inches and be placed loosely with no compaction.

DRAFT DRAWING C604.98 - Detention Basin Permeable Swale