

Land Development Code

Article 6 Technical Standards and Requirements

Division 7 Tree Protection and Replacement

Sec. 6.7.1 Purpose and intent.

- A. The purpose of this division is to regulate the protection, removal, replacement, and maintenance of trees in public and private property. Tree protection and replacement shall work cooperatively with landscaping requirements to preserve and enhance the aesthetic quality of Marion County, complementing the natural and built environments, while providing shade and habitat through:
- (1) Preservation of existing trees and native plant communities;
 - (2) Replacement of trees that are removed;
 - (3) Maintenance of trees and
 - (4) Prevention of tree abuse; and
 - (5) Enforcement.

Sec. 6.7.2 The preservation and replacement of trees and protected plant species shall apply to all development with the following exceptions:

- A. The removal of trees for purposes of conducting bona fide agricultural uses such as field crops, landscape nursery, citrus nursery, forest crops, animal husbandry, greenhouses, aquaculture, silviculture and the like, on lands with an agricultural zoning classification.
- B. Property used for bona fide agricultural use, as listed above, zoned other than agriculture and possessing an agriculture classification from the County Property Appraiser per § 193.461 FS. Lands with an urban land use designation may not use this exemption.
- C. On lands where either of the two exemptions above has enabled tree removal without a permit, no applications for any land use changes shall be made within one year of the tree removal date unless:
- (1) The applicant provides tree replacement at 100 inches DBH of native trees per acre, or lower based on the pre-clearing density of existing trees, or
 - (2) The applicant/owner provides payment into a Tree Mitigation fund in the equivalent amount of planting 100 inches DBH of native trees per acre or lower, based on the pre-clearing density of existing trees.
- D. The removal of trees which have a DBH of less than 10 inches, except those trees which have been designated replacement and conservation trees pursuant to Section 6.7.9.G.
- E. The removal of trees on an individual parcel of record used or to be used for single-family dwellings.
- F. The removal of trees associated with the County's construction, rehabilitation, or routine maintenance of roads and drainage systems within public rights-of-way or easements.
- G. The removal of trees associated with the rehabilitation or routine maintenance of roads and drainage systems within private rights-of-way or easements.
- H. Tree removal or trimming for the construction of firebreaks, firelines, and surveying.
- I. The removal of trees which pose an immediate and direct threat to persons or property, and the removal of trees that are dead or dying due to natural causes.
- J. Transplanting of any size tree.
- K. Removal of trees required by a development plan which has been fully approved by the County.
- L. Removal of exotic tree or nuisance tree species as listed by the [UF/IFAS Assessment of Non-native Plants](#), "Prohibited" or "Invasive – Not Recommended" tables, as updated.

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Sec. 6.7.3 Tree protection.

A. Design for the protection of trees.

- (1) Every reasonable effort should be made to minimize tree removal. Tree preservation shall be an integral part of the site planning or subdivision design process. Tree preservation shall be conceived in a total pattern throughout the site, integrating the various elements of site design, preserving and enhancing the particular identity of the site.
- (2) The preservation of existing trees and vegetation for use as perimeter land use buffers shall be considered during the site design process and implemented to preserve habitat while lowering the cost of development.
- (3) In all cases, a post-development ratio of shade trees to the area of the site as required in Section 6.7.4.
- (4) All trees with a DBH of 10 inches or larger shall be considered protected trees unless listed by the [UF/IFAS Assessment of Non-native Plants](#), "Prohibited" or "Invasive – Not Recommended" tables, as updated.
- (5) A proper evaluation shall be made to determine if existing protected trees, or groups of trees, are good candidates for preservation before final site plans are developed. The evaluation shall be used to guide decisions about tree preservation, tree protection, and tree removal and shall include:
 - (a) Determination of species of tree(s);
 - (b) Assessment of the health of the tree(s);
 - (c) Determination of the condition of the tree(s) based on the species, health, and age and whether the tree(s) will provide a lasting value to the finished project (trees with fast growth habits and have a shorter life span may not be desirable);
 - (d) Assessment of the size (DBH and canopy) of the tree(s);
 - (e) Assessment of the rarity, uniqueness, and character of the tree(s);
 - (f) Assessment of the historic value, status as a specimen tree, or other outstanding quality;
 - (g) An general overview of the site and whether the tree(s) will provide a lasting and positive contribution to the site and general surroundings, and
 - (h) Determination if any minor alternations to the site topography will impact the long-term viability of preserving existing trees.

B. Tree protection zones are as follows:

- (1) Tree Protection Zone (TPZ) is a defined area surrounding the trunk of a tree (or group of trees) to be preserved, intended to protect roots and soil to ensure future tree health and stability.
 - (a) All tree measurements for tree protection and preservation shall be made at 4.5 feet above grade to establish the correct diameter at breast-height (DBH).
 - (b) The TPZ shall be located at the dripline of the tree (or group of trees) to be preserved. For tree protection requirements, the dripline shall be indicated on a plan as required in Section 6.7.6.E and determined by either of the following methods:
 1. Field location by either a Surveyor and Mapper, a Landscape Architect, or a Certified Arborist, or
 2. Utilizing a "desktop canopy" rule generally understood as using one foot for every inch of DBH. For example, a 30 inch diameter tree would have a 30 foot radius dripline.
- (2) The Critical Root Zone (CRZ) is the area of soil around a tree trunk where roots are located that provide stability and uptake of water and minerals required for tree survival.
 - (a) No excavation, filling, trenching, or other intense disruption of the root zone is allowed within the CRZ.
 - (b) The CRZ is established on a tree-by-tree basis through on-site review and assessment by either a Landscape Architect or a Certified Arborist prior to construction.
 - (c) Damage to roots in this area may result in penalties or fines.

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- (3) The County's Landscape Architect, or designee, may reduce the limits of the TPZ to allow authorized construction to occur.
- (4) No reduction of the TPZ or removal of barricades may occur without prior written authorization from the County's Landscape Architect.
- (5) The TPZ may be temporarily reduced in size and/or barricades may be temporarily removed to allow for minor construction or maintenance within the TPZ. Barricades shall be reinstalled as soon as work within the TPZ is completed.
- (6) The TPZ shall not be reduced to any point within the CRZ.

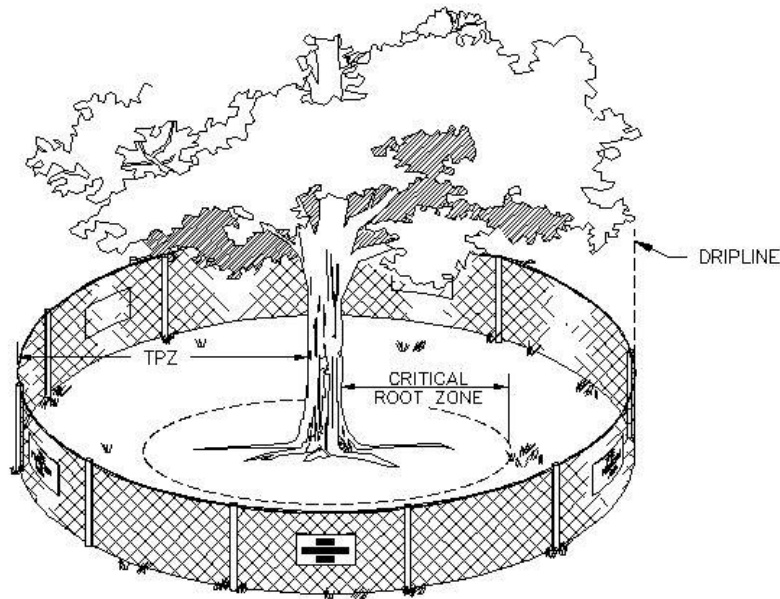


Figure 6.7-1 Tree Protection Zones

- C. Tree protection barricades shall be:
 - (1) No less than four feet in height.
 - (2) Constructed of rigid material capable of surviving for the duration of the construction.
 - (3) Posted with highly visible signs placed on the tree protection barricades at each quadrant of single protected trees and along driplines of groups of trees being protected at 50 foot intervals or less. Signs shall include the words "Tree Protection Zone."
- D. Pre-construction tree protection.
 - (1) The owner shall be responsible for insuring that all possible measures are taken to avoid damage to trees not approved for removal.
 - (2) Prior to any clearing, grubbing, or any construction, tree protection barricades shall be erected around all trees, or groups of trees, within the construction area which are to be preserved.
- E. Tree protection shall continue during the course of construction. The following requirements shall be conditions of tree removal permits, all permits for construction in public rights-of-way, and all development permits issued under and pursuant to this Code:
 - (1) The cleaning of construction equipment or material or the disposal of waste materials including but not limited to, paint, oil, solvents, asphalt, concrete, and mortar within the TPZ of any tree which is being protected is not allowed.
 - (2) The movement of equipment or the storage of equipment, materials, debris, or fill within the TPZ of any

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tree which is being protected is not allowed.

- (3) The contractor shall inspect all tree protection barricades and signs on a weekly basis during the course of construction. Any barricade or sign which has been damaged or is missing shall be replaced immediately.
- (4) If any tree which has not been approved to be removed is destroyed, or receives major damage during construction, with the exception of natural events, so as to place its long term survival in question, the tree(s) must be replaced at an inch-to-inch basis of the total (combined) DBH of the tree(s) so destroyed or damaged. The replacement tree(s) shall be of comparable species of the destroyed or damaged tree(s) with a minimum replacement size of 3.5 inch caliper. The County reserves the right to establish a replacement value for such trees and payment into the Tree Mitigation Fund may be authorized by the County's Landscape Architect.

Sec. 6.7.4 Shade trees are required for all developments excluding residential developments.

- A. The post-development ratio of shade trees to the area of the site shall be a minimum of one shade tree per 3,000 square feet.
- B. Shade trees may include:
 - (1) Protected and preserved trees which have a favorable assessment, and/or
 - (2) Trees as required for buffers, parking areas, vehicle use areas, and building areas, and/or
 - (3) Trees as required as replacement trees.
- C. When mature trees with a full canopy of 30 foot radius or larger, with a favorable assessment, are preserved on the project site, a credit of two shade trees may be used towards the overall shade tree requirement.
- D. Required shade trees shall meet the minimum size requirements in Section 6.8.10.C.

Sec. 6.7.5 Tree Removal Permit.

- A. For tree removals not associated with any development as outlined in this division, refer to **Section 2.X.X – Stand Alone Permits**. For all other tree removal applications, the approved development plans shall serve as the Tree Removal Permit.
- B. A tree removal permit shall be required for the removal of any tree with a DBH of 10 inches or larger, except for exempt activities as outlined in Section 6.7.2. A tree removal permit shall be obtained from the County's Landscape Architect, or designee, prior to any site clearing, grading, or for any construction which requires a permit from the Marion County Building Department. The failure to obtain any such permit when required shall be a violation of this Code, subject to penalties provided herein.
- C. A tree removal permit shall be obtained by any public utility undertaking construction activities that require tree trimming or tree removal, unless the public utility has been granted an exemption. The Board may grant an exemption after reviewing policies submitted by a public utility which govern their tree trimming or tree removal practices and finding that such policies are consistent with the intent of the Code. Board granted exemptions will be valid for a period of three years from the date granted unless revoked. The Board shall provide 30 days notice to a public utility of intent to revoke any such exemptions.
- D. Tree removal permits shall expire within one year or upon expiration of the building permit, whichever comes first. Trees authorized to be removed may not be removed after the permit expires unless a new permit is obtained pursuant to this division.

Sec. 6.7.6 Submittal requirements. The following requirements shall apply to the application for tree removal permits and are in addition to the Minimum Plan Requirements:

- A. Depending on the density of existing trees, the applicant may provide a separate "Tree Removal and Preservation Plan." For development sites with lower density of trees, such information may be indicated on the Site Plan or the Landscape Plan. Either method used shall indicate the location of all trees, with a DBH of 10 inches and larger, to be removed and trees to be preserved. Preserved trees and replacement trees shall be indicated on the Landscape Plan to demonstrate the final appearance of the site.

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- B. Tree calculations shall include:
 - (1) The total numbers of existing trees within the site and the respective DBH of each tree;
 - (2) The pre-development ratio of native tree inches-per-acre;
 - (3) The total DBH inches of native trees to be removed; and
 - (4) The total DBH inches of native trees to be preserved.
- C. A tree protection detail which graphically indicates the requirements of tree protection as required by this division.
- D. List general prohibitions on the plan as stated in Section 6.7.3.E.
- E. Indication of all TPZs on the site plan, grading plan and on which ever plan is used to demonstrate tree preservation and replacement.
- F. Fees required for review and issuance of tree removal permits, inspections, and restoration plans shall be established by the Board, by resolution. Tree removal permit application fees for projects associated with any development (excluding stand alone permits) shall be included in the overall plan review and application fees available at the [Office of the County Engineer](#).

Sec. 6.7.7 Review and approval procedures.

- A. During review of tree preservation submittals, the County's Landscape Architect, or designee, may determine that modifications of the proposed plans or calculations are necessary. Conditions that may require changes include, but are not limited to, the following:
 - (1) Preserving any tree due to their age, size, rarity, uniqueness, historic value, status as a specimen tree, or other outstanding quality.
 - (2) Proposed grading or clearing activities do not follow the requirements of this division.
 - (3) Proposed habitat destruction which conflicts with the requirements in Division 6.6.
- B. The applicant will be asked to revise and update the tree preservation information according to review comments.
- C. After approval, the County's Landscape Architect, or designee, shall issue a tree removal permit if such tree removal is in accordance with all provisions of this Code. The approved development plans shall serve as the Tree Removal Permit.

Sec. 6.7.8 Protected tree replacement requirements. All trees not permitted for removal must be protected and maintained. For those protected trees permitted for removal, trees shall be replaced in accordance with the minimum standards set forth below.

- A. Replacement is not required where the property owner retains existing trees on the site which total an average of 100 inches DBH per acre. If replacement is necessary, a minimum of 100 inches DBH per acre on the average shall be achieved.
- B. If the pre-development number of inches is less than 100 DBH per acre on the average, the property owner shall replace trees to equal the pre-development number of DBH inches.
- C. Replacement of trees less than 30 inches DBH and permitted for removal shall be as described below:
 - (1) Existing trees measuring 10 inches DBH to 19 inches DBH shall be replaced with a ratio of one inch replacement per two inches removed and the minimum replacement tree size is 3.5 inch caliper.
 - (2) Existing trees measuring 20 inches DBH to 29 inches DBH shall be replaced with a ratio of 1.5 inches replacement per two inches removed and the minimum replacement tree size is 3.5 inch caliper.
- D. Replacement of trees 30 inches DBH or greater and permitted for removal shall be as described below:
 - (1) All trees which receive a favorable assessment may be approved for removal by the County's Landscape Architect, or designee, under the following circumstances:
 - (a) The tree materially interferes with the proposed location, service or function of the utility lines or

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services, or rights-of-way, and

(b) The tree cannot be preserved through re-design of the infrastructure.

(2) All trees which receive a favorable assessment shall be replaced inch-for-inch and the minimum replacement tree size is 4.0 inch caliper.

(3) All trees which receive an unfavorable assessment shall be replaced with a ratio of 1.5 inches replacement per two inches removed and the minimum replacement tree size is 3.5 inch caliper.

E. Trees removed pursuant to a permit for construction in rights-of-way, approved by the County, State or Federal authority, shall not be required to replace the DBH of trees removed if such authority demonstrates that such trees conflict with proposed utilities, drainage, or roadway construction.

Sec. 6.7.9 Replacement trees.

A. Replacement trees are a part of the comprehensive tree program and shall work in combination with required shade trees, buffer trees, and any other required landscaping.

B. All trees and/or palms used for tree replacement purposes shall be nursery grown and Florida No. 1 quality or better, as established by *Grades and Standards for Nursery Plants*, Department of Agriculture, State of Florida, as amended.

C. Replacement trees shall meet the minimum tree requirements established in Section 6.7.8.

D. Replacement trees shall be Florida native species compatible to the site.

E. Palms may only be used to replace palms that are permitted for removal. Replacement palms shall have a clear trunk height of 10 foot minimum. The use of palms shall work with the required palm ratio as required in Section 6.8.10.C.

F. For trees removed pursuant to a tree removal permit, required replacement trees shall be located within the parcel boundaries shown on the site plan. If space constraints are such that the replacement trees cannot be located within the parcel boundaries using sound horticultural and design principles, then the replacement trees may be located on public property at the County's discretion. The public property location shall be specifically designated by the County and such replacement trees shall be donated to the County. The County will be responsible for maintenance of donated trees on public property.

G. As an alternative to replacement, the property owner may comply with the requirement of Section 6.7.8 by designating existing trees on site which are native tree species and less than 10 inches DBH as conservation trees, provided that the property owner takes steps to designate and protect such conservation trees.

A property owner designating conservation trees shall record in the public records of Marion County, a notice to subsequent property owners that the site contains conservation trees, subject to maintenance requirements, with reference to the development plan on file with the County designating such trees. A copy of such recorded notice on a form provided by the County shall be supplied to the Planning/Zoning Manager, or designee, prior to the issuance of a Certificate of Occupancy.

Sec. 6.7.10 Tree Mitigation Fund.

A. The Tree Mitigation Fund has been created in the general trust fund of Marion County for the purpose of accepting and disbursing the contributions made to the Board as part of the tree replacement monies deposited for tree replacement purposes. This fund shall be used to enhance tree replacement in Marion County.

B. An application to pay in lieu of installing any required replacement trees is made through the County's Landscape Architect. The "pay in lieu" option shall only be used for replacement trees and for no other landscape or tree planting requirement as stated in this Code.

C. At the County's discretion, in lieu of installing replacement trees, a permittee may pay a fee into the Tree Mitigation Fund at a per-tree cost. The amount of such fee shall be determined on a case by case basis through the public solicitation for bids and the amount shall be based on:

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- (1) The wholesale cost of material
 - (2) Cost of labor for installation
 - (3) Cost of maintenance for two years
- D. Payment into the Tree Mitigation Fund shall be recommended by the County's Landscape Architect and approved by the Board prior to issuance of the tree removal permit.
- E. Tree mitigation funds shall be used by the County for the installation, establishment, and maintenance of trees on public property within Marion County.

Sec. 6.7.11 Tree maintenance and management.

- A. Unless otherwise permitted by this division, no person shall cause or authorize:
- (1) The removal of any protected tree without first obtaining a tree removal permit as required by this Code.
 - (2) Tree abuse which includes:
 - (a) Hatracking a tree; or
 - (b) Destroying the natural habit of tree growth; or
 - (c) Pruning which leaves stubs or results in a flush cut; or splitting of limb ends; or
 - (d) Removing tree bark to the extent that if a line is drawn at any height around the circumference of the tree, over 1/3 of the length of the line falls on portions of the tree where bark no longer remains; or
 - (e) Using climbing spikes, nails, or hooks, except for purposes of total tree removal or as specifically permitted by standards set by the ANSI, as updated; or
 - (f) Pruning that does not conform to standards or recommendations set by the ANSI, as updated; or
 - (g) Pruning of live palm fronds which initiate above the horizontal plane; or
 - (h) Overlifting a tree; or
 - (i) Shaping a tree.
 - (3) Any encroachments, excavations, or change the natural grade within the Tree Protection Zone (TPZ), as defined herein, of a tree unless it can be demonstrated to the County's Landscape Architect prior to commencement of said activity, that the activity will not negatively impact any tree.
 - (4) Land clearing or the operation of heavy equipment in the vicinity of a protected tree without placing and maintaining a protective barrier around the TPZ.
 - (5) The storage or use of materials or equipment within the TPZ of any protected tree, or attachments, other than those of a protective and non-damaging nature, to any tree.
 - (6) Land clearing, including the removal of understory, without first obtaining authorization as herein provided.
- B. The following requirements shall be conditions of any tree removal permit which includes a requirement for replacement trees:
- (1) Replacement trees required in conjunction with a commercial or industrial development or subdivision approval shall be considered required improvements and shall be subject to certification of satisfactory completion contained in this Code.
 - (2) All replacement trees shall be maintained in a living, healthy condition for a period of two years following final inspection and approval, or else be replaced, by the owner, successor, or assignee. No replacement shall be required beyond such two-year period. After the two-year period, the owner of record shall be responsible for maintaining the replacement trees in a healthy condition.
 - (3) The permittee or the property owner shall record in the public records of Marion County, appropriate notice to subsequent owners of the maintenance period or replacement requirement for replacement trees with reference to the development plans on file with the County identifying such trees. A copy of such recorded notice shall be supplied to the Zoning Manager, or his designee, prior to the issuance of a Certificate of Occupancy.

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- (4) For residential and mixed use developments where tree preservation and replacement requirements are approved with any application, the developer shall require future property owners of lots where protected trees have been preserved to continue to protect and preserve such trees. Such requirements shall run with the parcel until removal of the tree(s) is required due to age, declining health, or for the protection of public safety.

Sec. 6.7.12 Tree inspections. The following tree preservation and/or replacement inspections shall be required to ensure compliance with this division and with the requirements of permits issued hereunder. No Certificate of Occupancy or Certificate of Completion, as appropriate, may be issued for any development involving the removal of trees requiring a permit until all of the following inspections have been completed and approval is granted:

- A. A preliminary inspection shall be conducted by the County's Landscape Architect, or designee, to confirm that the permittee has marked trees permitted to be removed and has installed tree protection barricades around trees, or groups of trees, to be preserved prior to any clearing, grubbing, or construction. Any deficiencies noted during this inspection shall be cause to withhold approval until they are corrected by the permittee and reinspected. Approval, after preliminary inspection, shall be noted by the County's Landscape Architect, or designee, on the permit and shall constitute notice to proceed with tree removal.
- B. A final inspection shall be conducted by the County's Landscape Architect, or designee, after completion of tree removal and replacement in accordance with the approved plans. Approval, after final inspection, shall be noted by the County's Landscape Architect, or designee, on the permit and shall constitute notice of commencement of the required maintenance period of replacement trees if replacement is required.

Sec. 6.7.13 Violation and Enforcement. It shall be a violation of this Code to fail to obtain a tree removal permit when required, to fail to comply with any condition of any tree removal permit issued, or to violate any provision of this division. When such violations occur, the following sanctions apply:

- A. If unauthorized tree removal or site grading occurs, the County's Landscape Architect, or designee may issue a stop work order for the affected project area of such unauthorized tree removal and all related site work will cease until a restoration plan is prepared by the owner, developer, contractor, or agent, and then submitted to, and approved by the County's Landscape Architect, or designee.
- B. If a restoration plan is not presented within 30 days, the owner, developer, contractor, or agent will be cited by the County's Landscape Architect, or designee, and referred to the Code Enforcement Board.
- C. A Certificate of Occupancy will not be granted until all trees and vegetation shown upon the approved restoration plan have been installed and all site grades restored.
- D. All trees and vegetation shown upon the approved site restoration plan must be installed on the property and the site grade restored even if project termination occurs before completion of the project. Failure to complete the approved restoration plan is a violation of this Code and the owner, developer, contractor, or agent will be cited by the County's Landscape Architect, or designee, and referred to the Code Enforcement Board.
- E. In addition to all other remedies provided herein, the Landscape Architect may seek injunctive relief or the imposition of fines and penalties for any violation of this division.

Division 8 Landscaping

Sec. 6.8.1 Purpose and intent.

The purpose and intent of this division is to provide landscaping guidelines establishing minimum standards and criteria for the design, installation, and maintenance of landscaping which enhances the aesthetic appearance of Marion County, complimenting the natural and built environments, reducing noise and glare, improving air and water quality, providing shade and habitat, and buffering the aspects of development.

Sec. 6.8.2 A landscape plan which indicates the following is required for all development except for individual single-family homes and duplexes:

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- A. All existing landscaping, indigenous open space, and natural features;
- B. Locations of existing protected trees, labeled and with sizes provided, groups of trees, landscaping and other vegetation to be preserved;
- C. Vegetation and tree protection barricades;
- D. All replacement trees as required per Section 6.7.8;
- E. All proposed landscape areas, labeled and with sizes provided;
- F. Construction details as applicable, including but not limited to:
 - (1) Tree protection;
 - (2) Tree, palm, and shrub installation;
 - (3) Details for specialized installations;
 - (4) Elevation drawings of walls proposed for buffers and/or screening; and
 - (5) Cross section of proposed walls/berms/combinations for buffers.
- G. Plant schedule:
 - (1) A key matching the plants being specified (may be plant symbols or written)
 - (2) Quantities of plants being specified
 - (3) Common plant names
 - (4) Scientific plant names
 - (5) Plant specifications including height, spread, and spacing
 - (6) Native status
- H. Calculations for required landscaping:
 - (1) Tree preservation and replacement
 - (2) Shade tree requirements
 - (3) Buffers
 - (4) Parking areas
 - (5) Vehicle use areas
- I. Notes including installation instructions and special requirements related to licensing, [tree protection](#), [maintenance](#), fertilizer use, and watering.
- J. Notes regarding [tree protection](#) and inspections as outlined in Section 6.7.3 and 6.7.12 and shall also be provided on the site and grading plan sheets.

Sec. 6.8.3 Landscape design standards.

- A. All new landscapes in Marion County shall be designed to protect the County's unique natural resources by conserving water, protecting the quality of groundwater, reducing waste and pollution, creating wildlife habitat, and preventing erosion by implementation of [Florida-Friendly Landscaping](#) (FFL) by UF/IFAS and FDEP, including but not limited to:
 - (1) Right plant, right place;
 - (2) Water efficiently;
 - (3) Fertilize appropriately;
 - (4) Mulch;
 - (5) Attract wildlife;
 - (6) Manage yard pests responsibly;
 - (7) Recycle yard waste;
 - (8) Reduce stormwater runoff; and

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- (9) Protect the waterfront.
- B. All plant species listed as “Prohibited” in the [UF/IFAS Assessment of Non-native Plants](#) (Central Zone) shall be removed from proposed development sites. Plant species listed as “Invasive – Not Recommended” shall be removed from all proposed development sites outside of the Urban Growth Boundary (UGB); they may remain within the UGB with authorization from the County Landscape Architect.
- C. Landscaping within rights-of-way shall require approval by the County Engineer, or designee.
- D. Trees shall not be located in areas that will cause conflict with overhead or underground utilities. Large trees shall not be located within 30 feet of power lines. Alternative design strategies may be approved by the County’s Landscape Architect when conflicts with existing utilities cannot be avoided.

Sec. 6.8.4 For non-residential development, at least 20 percent of the land to be developed shall be landscaped.

- A. When a project area is less than the size of the overall parcel to be developed, the required landscape area calculation may be reduced to apply to the project area as authorized by the County Landscape Architect. All other requirements directed by the Board, DRC, or included in this division shall apply.
- B. Landscape areas shall include:
 - (1) Buffers;
 - (2) Landscaping required for parking areas;
 - (3) Building landscaping; and
 - (4) Service and equipment area screening.
- C. Landscape areas may also include planted stormwater management areas with a depth of four feet or less.
- D. Credit towards the landscape area requirements may be allowed for all or part of preserved native habitat if the applicant demonstrates that it includes one or more of the following:
 - (1) Tree clusters including native vegetative communities are protected from development impact.
 - (2) Vegetative areas with native understory flora are protected from development impact.

Sec. 6.8.5 For new residential developments and mixed use developments, landscape plans shall demonstrate the following:

- A. The landscape design standards in Section 6.8.3 shall be provided for any proposed landscaping in the following areas:
 - (1) Development entry areas.
 - (2) Medians and/or boulevards.
 - (3) Community buildings.
 - (4) Recreation and common areas.
- B. New residential and mixed use developments shall create Marion-Friendly Landscape Areas (MFLA) to minimize impacts to the quality and quantity of natural groundwater recharge.
 - (1) Non-residential components of mixed use development shall adhere to the landscape requirements as in accordance with Section 6.8.4.
 - (2) MFLA shall not be located on residential lots.
 - (3) The MFLA requirements for the residential components are as follows:
 - (a) Within the Primary SPZ, 20 percent of the project area shall be MFLA.
 - (b) Outside of the Primary SPZ, 15 percent of the project area shall be MFLA.
 - (4) The area limitations under subsection (3), above, may be reduced in accordance with a mitigation strategy approved by the County.
- C. The developer shall inform future owners within residential developments that all permit applications for construction shall include a landscape plan which meets the requirements of this division.

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D. In new residential developments with more than 50 lots, the developer shall also promote the practices and principles of FFL as described in the [Florida Yards and Neighborhoods Handbook](#), as amended. A program which promotes these principles shall be incorporated into and made part of the restrictive covenants and shall include:

- (1) Information about the applicable landscaping requirements under this division and under Division 6.8;
- (2) Procedures for future owners to follow when implementing FFL on individual lots, and
- (3) Water conservation and FFL educational materials to all new homeowners; and
- (4) Information regarding landscape irrigation scheduling as stipulated in Section 6.9.9.

Sec. 6.8.6 Buffers.

- A. It is the intent of this section to eliminate or reduce the negative impacts of the adjacent uses upon each other such that the long term continuance of either use is not threatened by such impacts and the uses may be considered compatible.
- B. Buffers shall provide a year-round screen and provide an aesthetic quality, especially along public rights-of-way, which enhance travel corridors and screen unsightly areas from public view.
- C. Plant species shall be mixed to provide diversity and appeal.
- D. Buffers may consist of landscaping, buffer walls, fencing, berms, or combinations thereof which work cohesively to achieve the intent of buffering.
- E. Every development, with the exception of the construction of an individual single-family residence or duplexes on an individual parcel of record, shall provide sufficient buffering when topographical or other barriers do not provide reasonable screening.
- F. If buffers are required, the length shall be measured along each property line, and shall exclude driveways and other access points.
- G. No buildings, structures (other than buffer walls or buffer fences), storage of materials, or parking shall be permitted within the buffer area.
- H. Buffers shall not be located on any portion of an existing or dedicated right-of-way.
- I. Arrangement of plantings in buffers shall provide maximum protection to adjacent properties, avoid damage to existing trees and plant material, and take mature growing sizes into consideration regarding shade, root damage, and interference with nearby utilities.
- J. Required buffer types between land uses.
 - (1) Specialized Commerce Districts include a mix of both commercial and industrial land uses, therefore, buffer requirements shall apply only to lots on the perimeter of the district
 - (2) Buffer installation and maintenance shall be provided concurrently with the development of the more intense land use, with the following deviations:
 - (a) When a new but less intense land use is developed adjoining a pre-existing developed site with a higher intensity use, the new use is subject to providing the required land use buffer.
 - (b) When a new but less intense land use is responsible for providing the required land use buffer, the developer may reduce the required buffer by one buffer type with acknowledgement of the buffer reduction clearly noted on the development plan.
 - (c) The development of an individual single family residence or duplex is exempt from providing the required buffer.
 - (3) In interpreting and applying the provisions of buffers, development is classified into categories shown in Table 6.8-1.
 - (4) Table 6.8-2 provides the type of buffer required between a proposed use and an existing use, or in the absence of an existing use.

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Table 6.8-1. Buffer Type Requirements

AG	Agriculture, Rural Lands, Natural Reservation
SFR	Single family, duplex residential
MF	Multi-family residential
COM	Commercial, RV parks, Commercial Recreation
IND	Industrial uses
PUB	Public Use (including Government, Institutional, and related Professional Offices)
ROW	Arterial or Collector Right-of-Way or Road Easement

Table 6.8-2 Land Use Categories for Buffers

		Permitted or Existing Use						
		AG	SFR	MF	COM	IND	PUB	ROW
Proposed Use	AG	-	-	-	-	-	-	-
	SFR	E	-	C	A	B	C	C
	MF	E	A	-	A	B	C	C
	COM	D	B	B	-	B	C	C
	IND	B	B	B	B	-	B	D
	PUB	E	B	C	C	C	-	C

- K. Description of buffer classifications. The content and composition of each buffer type is described in the following items. The design professional shall use these requirements to design buffers that are thoughtfully designed and enhance perimeter of the development site. Visual screening shall be achieved through the use of proper plant material, arrangement, and layering.
- (1) A-Type buffer shall consist of a 30 foot wide landscape strip without a buffer wall. The buffer shall contain at least three shade trees and five accent/ornamental trees for every 100 lineal feet or fractional part thereof. Shrubs and groundcovers, excluding turfgrass, shall comprise at least 50 percent of the required buffer area and shall form a layered landscape screen with a minimum height of three feet achieved within one year of planting.
 - (2) B-Type buffer shall consist of a 20 foot wide landscape strip with a buffer wall. The buffer shall contain at least two shade trees and three accent/ornamental trees for every 100 lineal feet or fractional part thereof. Shrubs and groundcovers, excluding turfgrass, shall comprise at least 50 percent of the required buffer.
 - (3) C-Type buffer shall consist of a 15 foot wide landscape strip without a buffer wall. The buffer shall contain at least two shade trees and three accent/ornamental trees for every 100 lineal feet or fractional part thereof. Shrubs and groundcovers, excluding turfgrass, shall comprise at least 50 percent of the required buffer and form a layered landscape screen with a minimum height of three feet achieved within one year.
 - (4) D-Type buffer shall consist of a 15 foot wide landscape strip with a buffer wall. The buffer shall contain at least two shade trees and three accent/ornamental trees for every 100 lineal feet or fractional part thereof. Shrubs and groundcovers, excluding turfgrass, shall comprise at least 25 percent of the required buffer.
 - (5) E-Type buffer shall consist of a five foot wide landscape strip without a buffer wall. The buffer shall contain at least four shade trees for every 100 lineal feet or fractional part thereof. Shrubs shall be planted in a double-staggered row and be capable of reaching a maintained height of six feet within three years. Groundcovers and/or turfgrass shall not be used in this buffer.
- L. Buffer walls, buffer fences, and berms.
- (1) Where buffer walls are required by this article, a combination of buffer walls and berms may be used to meet the intent of buffering. Buffer fences may be used to as a substitute for buffer walls with approval of the DRC. The buffer walls, buffer fences, and berms shall:

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- (a) Not be constructed or installed in a manner which creates a threat to public safety or interferes with vehicular circulation;
 - (b) Be designed to be compatible with existing and proposed site architecture and the character of the surrounding and adjacent settings including the style and selection of materials; and
 - (c) Be situated so that the wall or fence components are within the buffer limits and any required landscaping shall be installed on the public view side of the wall.
- (2) When a buffer wall is required, the buffer wall may be used in conjunction with a berm to achieve a minimum final elevation of six feet in height. When buffer walls, berms and/or combinations of each are used, they shall be constructed to:
- (a) Ensure that historic and/or proposed water flow patterns are accommodated;
 - (b) Not interfere with or obstruct any stormwater facilities; and
 - (c) Provide sufficient ingress/egress for bicycle traffic and pedestrians access with proper arrangement to limit visibility into the proposed development.
- (3) If planted berms are used, the top of the berm shall have a four foot wide maintainable area. The maximum side slope for a berm planted with shrubs and woody groundcovers shall be 3:1. The maximum side slope for a berm planted with turfgrass shall be 3.5:1. Planting trees or shrubs on the very top of a berm is discouraged.
- M. Buffer plantings shall be irrigated appropriately for the specific plant species and characteristics of the site to promote healthy growth.
- N. Buffer areas shall be continually maintained and kept free of all trash and debris.

Sec. 6.8.7 Parking areas and vehicular use areas.

- A. A minimum five foot wide landscape area consisting of shrubs and groundcovers, excluding turfgrass, shall be provided around the perimeter of parking areas to form a landscape screen with a minimum height of three feet achieved within one year of planting. A land use buffer that abuts a parking area may satisfy this requirement.
- B. Landscaping adjacent to parking areas and vehicular use areas shall be protected from being damaged. Landscaping at the end of parking stalls shall be offset away from the parking stall to allow for vehicle overhang. The area between the landscape screening and the end of the parking stall shall be mulched and contain no vertical irrigation components.
- C. A landscaped parking lot island shall be located every ten parking spaces and shall be a minimum of 200 square feet in size with properly drained soils. For paved parking areas within a Primary SPZ, including those with permeable or porous surfaces, parking lot islands shall be completely planted with shrubs or groundcovers; the use of turfgrass is prohibited.
- D. Trees within parking areas.
 - (1) All trees required for parking areas and vehicular use areas shall be shade trees, unless required otherwise by provisions in this section.
 - (2) All parking lot islands, including terminal parking lot islands, shall contain one shade tree unless site lighting fixtures are proposed in said island. Double parking lot islands (where double-loaded parking bays are proposed) shall contain two shade trees.
 - (3) In parking lot islands with site lighting fixtures, an arrangement of one or two accent/ornamental trees shall be installed depending on the size and configuration of the island.
 - (4) Parking lot islands with control signage may contain other tree (or palm) species, in lieu of shade trees, which will not conflict with the visibility of such signage.
- E. Each row of parking spaces shall be terminated by a landscaped island.
- F. Divider medians may be used to meet parking area landscape requirements.

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- (1) The minimum width of a divider median shall be eight feet.
- (2) One shade tree shall be provided per 50 lineal feet of divider median.
- G. To offset heat gain from paved surfaces, shade trees as required in Section 6.7.4 should be located to provide as much shade as possible on such surfaces.
- H. Parking lot screening must be achieved regardless of other landscaping requirements in this article. Shade trees as required in Section 6.7.4 may be integrated into the parking area landscaping.
- I. All landscaping in parking areas and street frontages shall be placed so that it will not obstruct any sight triangle.

Sec. 6.8.8 Building landscaping.

- A. Landscape plantings shall be provided along the public view sides of all proposed structures to reduce the monotony of large blank walls, reduce heat gain and glare, and enhance the aesthetic appearance of the building.
- B. Landscape areas shall be provided adjacent to or within 25 feet from the building walls and shall extend along 60 percent of the total length of the wall, excluding those areas required for access to the building.
- C. Landscape areas shall be a minimum of five feet wide allowing for a minimum distance of two feet from the façade to the innermost plants.
- D. Large trees shall not be located within 20 feet of a building. Accent/ornamental trees shall be located sufficiently to allow for healthy growth and to minimize the need for pruning.

Sec. 6.8.9 Service and equipment areas.

- A. Utility areas and loading/unloading areas shall be screened as follows:
 - (1) A planting area a minimum of three feet wide and shall form a continuous three foot high landscape screen, or
 - (2) Buffer fencing with a minimum height of three feet.
- B. Garbage collection areas (dumpster pad) shall be screened with a wall, buffer fencing, or a landscape screen capable of reaching a minimum height of six feet within three years.
- C. Trees and shrubs shall remain eight feet from any fire service connection.
- D. Exterior air conditioning components shall be screened by locating the equipment away from public view or through the use of a landscape screen with a minimum height of three feet.

Sec. 6.8.10 General planting requirements.

- A. All trees, palms, shrubs, and groundcovers shall be nursery grown and Florida No. 1 quality or better, as established by *Grades and Standards for Nursery Plants*, Department of Agriculture, State of Florida, including latest updates, as amended.
- B. Plant palettes shall be appropriate for the development site and provide the highest level of diversity as practicable.
- C. Planting specifications are listed as follows:
 - (1) Native plant requirements:
 - (a) Within the UGB, a minimum of 25 percent of all proposed plant quantities, excluding turfgrass, shall be Florida native species suitable for use in Marion County.
 - (b) Outside of the UGB a minimum of 35 percent of all proposed plant quantities, excluding turfgrass, shall be Florida native species suitable for use in Marion County.
 - (c) A minimum of 50 percent of the required shade trees shall be Florida native species suitable for use in Marion County.
 - (d) To promote biological diversity, no more than 50 percent of the required shade trees for a

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development shall be of one species.

- (2) The use of invasive plant species is based on the [UF/IFAS Assessment of Non-native Plants](#) (Central Zone) as updated.
 - (a) Plant species listed as “Prohibited” are not permitted for use in any proposed development.
 - (b) Plant species listed as “Invasive – Not Recommended” are not permitted for use in any development outside of the UGB. This group of plants may be used within the UGB with subject to approval by the County Landscape Architect.
 - (c) Plant species listed as “Caution” may be used provided specific management strategies and monitoring are included in the project’s BMP manual.
 - (3) Trees
 - (a) Shade trees shall have a minimum caliper of 3.5 inches.
 - (b) Accent or ornamental (understory) trees shall have a minimum overall height of six feet and a minimum spread of 42 inches upon installation.
 - (4) Palms
 - (a) Not more than 25 percent of all required trees shall be palm trees unless a higher percentage is authorized as stated in Section 6.7.9.
 - (b) Additional palms may be provided in excess of the 25 percent threshold when three palms are used to substitute one required tree. Where specimen palms are specified, substitution may be a one-to-one ratio.
 - (c) Palm trees shall not be substituted for required shade trees.
 - (d) Palms shall have a clear trunk height of 10 feet minimum.
 - (5) Shrubs shall be a minimum height of 18 inches spaced appropriately for the species and the required screening and maintenance height.
 - (6) Groundcovers shall be those species of plants with a mature growing height of 24 inches maximum and spaced up to 2’ – 3’ on-center.
 - (7) Vining groundcovers shall have a minimum of three runners per plant. Vines may be spaced accordingly for the proposed use.
 - (8) Turfgrass may be of any variety which is adapted and suitable for use in Marion County. The use of rolled turf is prohibited on property with public access unless the supportive netting is removed and the integrity of the turf is not jeopardized during installation.
- D. Mulch types shall be of a renewable resource or a recycled product. The use of cypress mulch is discouraged.

Sec. 6.8.11 Landscape Installation.

- A. Any person providing landscape installation services for hire shall meet the licensing and certification requirements under Section 6.8.15.
- B. All plantings shall be installed according to current best management practices.
- C. Trees and palms shall be properly planted and guyed or staked.
- D. All plantings shall be properly watered during installation and through the establishment period for healthy growth as recommended by UF/IFAS.
- E. Installation shall mean survival in perpetuity, and replacement if necessary, of all materials. Dead and/or dying plant material shall be replaced by the owner within 30 days of notification by the County.

Sec. 6.8.12 Landscape completion inspection requirements.

Upon completion of the installation, the contractor shall request an inspection by the design professional. A [Landscape and Irrigation As-Built Certification](#) shall be signed and sealed by the design professional and submitted to the County Landscape Architect prior to the issuance of a Certificate of Occupancy.

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Sec. 6.8.13 Landscape Maintenance.

- A. All landscape areas shall be maintained in accordance with the [Florida-Friendly Best Management Practices for Protection of Water Resources by the Green Industries](#), UF/IFAS and FDEP.
- B. Trees or palms shall not be severely pruned or shaped. The natural growth habit of a tree or palm shall be considered during the design phase to avoid maintenance conflicts.
- C. Trees or palms which are guyed or braced shall have such guying or bracing removed once sufficient root growth has enable the tree or palm to support itself. Damaging trees with guying devices shall be considered a violation of this Code. Damaged trees shall be replaced at the expense of the owner.
- D. The alteration of any required and approved landscape area without obtaining prior written approval from the County is prohibited. The expansion of drought tolerant landscaping, excluding the replacement of planted areas with turfgrass, or replacing dying or diseased plants with similar plant material is excluded.
- E. Buffers and screening plantings shall provide healthy appearance year round and be maintained at the required minimum heights.

Sec. 6.8.14 Fertilizers and other landscape chemicals.

- A. Applicability.
 - (1) This section shall be applicable to and shall regulate any and all applicators of fertilizer and areas of application of fertilizer within the unincorporated area of Marion County, unless such applicator is specifically exempted by the terms of this **section** from the regulatory provisions of this Code. This section shall be prospective only, and shall not impair any existing contracts.
 - (2) This section requires the use of BMPs which provide specific management guidelines to minimize negative secondary and cumulative environmental effects associated with the misuse of fertilizers.
- B. Exemptions.

The provisions set forth above in this section shall not apply to:

 - (1) Bona fide farm operations as defined in the **Florida Right to Farm Act, § 823.14** FS, provided that fertilizers are applied in accordance with the appropriate Best Management Practices Manual adopted by the Florida Department of Agriculture and Consumer Services, Office of Agricultural Water Policy for the crop in question.
 - (2) Any lands used for bona fide scientific research, including, but not limited to, research on the effects of fertilizer use on urban stormwater, water quality, agronomics, or horticulture.
- C. Fertilizer content and application rates.
 - (1) Fertilizers applied to turfgrass and/or landscape plants within Marion County shall be applied in accordance with directions provided by **FAC Rule 5E-1.003(2)**, *Labeling Requirements for Urban Turf Fertilizers*.
 - (2) Fertilizer containing nitrogen or phosphorus shall not be applied before seeding or sodding a site, and shall not be applied for the first 30 days after seeding or sodding.
 - (3) Fertilizers should be applied to turf and/or landscape plants at the lowest rate necessary. Nitrogen shall not be applied at an application rate greater than 0.7 lbs of readily available nitrogen per 1,000 square feet at any one time based on the soluble fraction of formulated fertilizer, with no more than 1 pound total nitrogen per 1,000 square feet applied at any one time, and not to exceed the nitrogen recommendations set forth below on an annual basis:

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Table 6.8-3 Fertilizer application rates

Grass Species	Maximum N Application Rate (Lbs/1,000sf ² /year)
Bahia	3
Bermuda	4
Centipede	2
St. Augustine	3
Zoysia	4

- (4) No phosphorus fertilizer shall be applied to existing turf and/or landscape Plants within the County at application rates which exceed 0.25 pounds phosphorus per 1,000 square feet per application nor exceed 0.50 pounds phosphorus per 1,000 square feet per year.
- (5) Nitrogen or phosphorus fertilizer shall not be applied to turf or landscape plants except as provided in (1) above for turf, or in UF/IFAS recommendations for landscape plants, vegetable gardens, and fruit trees and shrubs, unless a soil or tissue deficiency has been verified by an approved test.

D. Timing of fertilizer application.

No applicator shall apply fertilizers containing nitrogen and/or phosphorus when soils are saturated.

E. Fertilizer-free zones.

- (1) Fertilizer shall not be applied to turf or landscape plants within 30 feet of any pond, stream, watercourse, lake, canal or wetland. The use of macro-tab slow release fertilizer tablets for landscape plants which are installed within the plant pits during plant installation is allowed.
- (2) Fertilizer shall not be applied to turf grass within the following areas:
 - (a) Seventy five feet of the WBSL of any spring, pond, stream, watercourse, lake, wetland or sinkhole or other karst feature that has an opening at the surface.
 - (b) Fifteen feet from the top of the bank of any drainage retention area, canal, or from the top of a seawall, unless a deflector shield, drop spreader, or liquid applicator with a visible and sharply defined edge, is used, in which case a minimum of 3 feet shall be maintained.
- (3) In the event an area is included in one or more of the areas described in **paragraph (2)** above, the more restrictive provision (i.e., the larger distance) shall apply.
- (4) Newly planted turf and/or landscape plants may be fertilized in this zone only for a 60 day period beginning 30 days after planting if need to allow the plants to become well established. Caution shall be used to prevent the direct deposit of nutrients into the water.

F. Low maintenance zones.

A 10 foot low maintenance zone is required from any pond, stream, water course, lake, wetland, or from the top of a seawall. A swale/berm system is recommended for installation at the landward edge of this low maintenance zone to capture and filter runoff. If more stringent County regulations apply, this provision does not relieve the requirement to adhere to the more stringent regulations. No mowed or cut vegetative material shall be deposited or left remaining in this zone or deposited in the water. Care should be taken to prevent the over-spray of aquatic weed products in this zone.

G. Impervious surfaces.

Spreader deflector shields are required when fertilizing via rotary (broadcast) spreaders. Deflectors must be positioned such that fertilizer granules are deflected away from all impervious surfaces, fertilizer-free zones and water bodies, including wetlands. Fertilizer shall not be applied, spilled, or otherwise deposited on any impervious surfaces. Any fertilizer applied, spilled, or deposited, either intentionally or accidentally, on any impervious surface shall be immediately and completely removed to the greatest extent practicable. Fertilizer released on an impervious surface must be immediately contained and either legally applied to turf or any other legal site, or returned to the original or other appropriate container. In no case shall fertilizer be

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washed, swept, or blown off impervious surfaces into stormwater drains, ditches, conveyances, or water bodies.

H. Management of grass clippings and vegetative matter.

In no case shall grass clippings, vegetative material, and/or vegetative debris be washed, swept, piled or blown off into stormwater drains, ditches, conveyances, water bodies, wetlands, or sidewalks or roadways. Any material that is accidentally so deposited shall be immediately removed to the maximum extent practicable.

I. Training for fertilizer applicators.

- (1) Commercial applicators of fertilizer within the unincorporated area of Marion County, shall maintain current Limited Urban Commercial Fertilizer Applicator Certification through the Florida Department of Agriculture and Consumer Services by January 1, 2014, per §482.1562 FS.
- (2) Any other person whose duties include the application of fertilizer not required to maintain certification in (1) above, shall obtain a GI-BMP Certificate of Completion within six months of assuming such duties.
- (3) Private homeowners are required to follow the recommendations of the *Florida Yards and Neighborhoods Handbook* by FDEP and UF/IFAS, as amended except to the extent this Code provides more stringent requirements.

J. Enforcement.

- (1) In addition to county code enforcement officers, the County Administrator may also delegate enforcement responsibility for this section to agencies and departments of Marion County government, in accordance with state and local law.
- (2) Funds generated by penalties imposed under this section shall be used by the County for the administration and enforcement of section § 403.9337 FS, and the corresponding sections of this Code, and to further water conservation and nonpoint pollution prevention activities.

K. Penalties.

- (1) Violation of any provision of this section shall be subject to the following penalties:
 - (a) First violation: Written Notification and Education.
 - (b) Second violation: Written Notification and Education.
 - (c) Third violation: Fifty dollars (\$50).
 - (d) Fourth and subsequent violation(s): One Hundred dollars (\$100).
- (2) Each day in violation of this section within a 365-day period, beginning the date of the first violation, shall constitute a separate offense. The Board may take any other appropriate legal action, including but not limited to emergency injunctive action, to enforce the provisions of this section.

Sec. 6.8.15 Landscape installation and maintenance licensing and certification.

- A. Landscape installation professionals performing work for hire within the unincorporated areas of Marion County shall be landscape contractors licensed by the Marion County Building Department, unless otherwise licensed by the State of Florida.
 - (1) Unless subject by Florida Statutes to certain continuing education requirements, contractors licensed under this section are required to complete a minimum of eight Professional Development Hours or Continuing Education Units in Florida Friendly Landscaping Practices from a continuing education organization approved by the County before each succeeding license renewal or bi-annually, whichever is shortest. Compliance with this requirement will be confirmed at the time of license renewal, or by an approved audit procedure.
 - (2) A list of required and approved courses or certifications for paragraph (1) above will be maintained by the Marion County Licensing Board.
 - (3) A course or certification may be added to or withdrawn from the approved list using an approved petition procedure.

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- B. Landscape maintenance professionals performing work for hire within the unincorporated areas of Marion County shall possess current GI-BMP Certification of Completion.
- C. Any person providing services for hire regarding any aspect of landscape maintenance that includes the application of fertilizer or pesticide shall meet the applicable state and County licensing and certification requirements included herein.

Division 9 Irrigation

Sec. 6.9.1 Purpose and intent.

The purpose and intent of this division is to provide guidelines establishing minimum standards and criteria for the design, permitting, installation, and maintenance of irrigation systems to prevent the wasteful uses of water.

Sec. 6.9.2 Submittal requirements.

- A. An irrigation plan shall be provided prior to issuance of a development order or building permit.
- B. All irrigation systems, including temporary shall comply with the design standards included herein and shall be monitored for leaks and the adequate delivery of water.
- C. An irrigation plan which includes the following items shall be submitted:
 - (1) Signature and seal of the authorized design professional is required, excluding those plans prepared by the owner of an owner occupied single-family residence or owner occupied duplex;
 - (2) Limits of areas to be irrigated;
 - (3) Table or chart which includes all components used within the system:
 - (a) Symbol legend
 - (b) Type of component, including brand and model
 - (c) Application rate of each emitter type
 - (d) Precipitation rate of each emitter type
 - (4) System performance table:
 - (a) Design pressure
 - (b) Operating pressures
 - (c) GPM of each zone
 - (5) Location of rain sensor and/or soil moisture sensor;
 - (6) Location of controller;
 - (7) Location of point-of-connection or well;
 - (8) Location of backflow prevention device;
 - (9) Location of all valves, mainlines, lateral lines, and emitters;
 - (10) Construction details as applicable to the design;
 - (11) Notes including installation instructions and County's contractor licensing requirements when a contractor is used;
 - (12) Notes regarding the close out and completion requirements; and
 - (13) Notes regarding maintenance, post-construction adjustments, and watering restriction.

Sec. 6.9.3 Irrigation Design Standards.

- A. Irrigation systems shall be designed for the efficient application of water based on sound design principles and the use of available irrigation technology to apply only the amount of water necessary to meet landscape needs.
- B. Irrigation design standards shall apply to the installation and use of new landscape irrigation systems, except

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for the following:

- (1) Irrigation systems associated with bona fide agricultural operations.
 - (2) Irrigation systems at intensive recreational areas, excluding common areas and open areas at such facilities.
- C. Water application limits for irrigation systems are as follows:
- (1) The use of high volume irrigation is limited to:
 - (a) Turfgrass areas.
 - (b) Groundcovers that have a mature or maintained height no greater than one foot.
 - (c) Trees and shrubs that occurs incidental to turf irrigation, subject to approval by the County's Landscape Architect.
 - (2) A low volume irrigation area may be used in any landscape area.
 - (3) Efficient and water saving heads (rotating stream nozzles) may be used in any landscape area.
- D. Irrigation systems shall use the following principles:
- (1) Only apply the adequate irrigation for the proposed plant palette and soil conditions;
 - (2) Avoid the application of water to impervious areas;
 - (3) Minimize the application of water to established landscapes;
 - (4) Separate turf and landscaping zones;
 - (5) Use heads/emitters with matched precipitation rates within each zone;
 - (6) Properly space irrigation heads based on site and climate conditions;
 - (7) Use pressure regulating devices (at control valves or at each head/emitter);
 - (8) Use in-line or in-head check valves to prevent low head runoff where final site topography dictates the need of such devices;
 - (9) Use automatic irrigation controllers that have program flexibility with non-volatile memory with the capacity to preserve programs;
 - (10) Properly install, maintain, and operate technology that inhibits or interrupts operation of the system during periods of sufficient moisture per § [373.62 FS](#).

Sec. 6.9.4 Irrigation system permit.

- A. An irrigation system permit is required for all new in-ground irrigation systems and for major modifications to existing in-ground irrigation systems. Major modifications shall include Increasing flow capacity of the existing system by more than 25 percent.
- B. Repairs and minor modifications shall not require a permit.
- C. Irrigation permits for portions of irrigation systems which are generally installed with major site developments such as subdivisions and golf courses may be issued separately.
- D. No part of this division mandates the installation of a permanent irrigation system. However, all landscaping required by this Code must be maintained in a living and healthy condition and meet the intent of Division 6.8.
- E. A valid permit must be properly displayed at the job site prior to commencement of work. A permit is valid for a period of six months from date of its issuance. The County may at its discretion extend this time limit for any reasonable period of time.
- F. A permit may be suspended or revoked by the County if any irrigation system installation is found in violation of the permit, Florida Statutes, FAC, this Code, any applicable County ordinance, or any of the following:
 - (1) Material misstatement or misrepresentation in the application for a permit;
 - (2) Failure to comply with the conditions set forth in the permit; and/or
 - (3) Failure to pay the required permit fee.

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Sec. 6.9.5 Irrigation system installation.

- A. Irrigation systems shall only be installed by installation professionals meeting the licensing requirements under Section 6.9.10, except those being installed by property owners on their own single-family residence or owner/occupied duplex.
- B. Irrigation systems shall be constructed in accordance with the Florida Irrigation Society's (FIS) Standards and Specifications for Turf and Landscape Irrigation Systems as updated.

Sec. 6.9.6 Completion inspection requirements.

- A. Irrigation installation professionals shall be accountable for the proper installation and compliance with the conditions of the irrigation permit and approved plans.
- B. Upon completion of the installation, the contractor or owner shall request an inspection by the irrigation design professional. Prior to the inspection, the irrigation installation professional shall produce a clear and legible as-built diagram which accurately represents the irrigation system was installed. The diagram shall be presented and reviewed during the final inspection. The diagram may be a marked-up copy of the approved irrigation plan and shall include at a minimum:
 - (1) Locations of all mainlines and mainline valves;
 - (2) Locations of all remote control valves;
 - (3) Water demand per zone in GPM, and
 - (4) Total water demand per operating cycle.
- C. The irrigation installation professional shall also provide to the owner:
 - (1) Irrigation system scheduling information;
 - (2) A copy of the irrigation controller owner's manual;
 - (3) Irrigation system maintenance schedule, which includes:
 - (a) Instructions for seasonal adjustments of controller and sensors.
 - (b) Instructions covering how and when to check for leaks.
 - (c) A schedule for checking for proper irrigation distribution coverage.
- D. Within 60 days after installation the irrigation controller shall be adjusted to be set in accordance with the applicable irrigation schedule set forth in this Code.
- E. Upon completion of the irrigation system installation and the acceptance of the as-built diagram and operational information, a [Final Inspection and Landscape/Irrigation Release](#) shall be signed and sealed by the irrigation design professional and submitted to the County's Landscape Architect.

Sec. 6.9.7 Certificate of Occupancy. When the irrigation system installation is part of a construction project, no certificate of occupancy shall be issued until:

- A. A complete, self-certification checklist, as well as a clear and accurate as-built sketch, have been submitted and accepted by the County; and
- B. The [Final Inspection and Landscape/Irrigation Release](#) has been received or the County has conducted and certified a final inspection.

Sec. 6.9.8 Irrigation system operation and maintenance.

- A. An irrigation installation professional who installs or performs work on an automatic landscape irrigation system must test for the correct operation of each inhibiting or interrupting device or switch on that system. If such devices or switches are not installed in the system or are not in proper operating condition, the contractor must install new ones or repair the existing ones and confirm that each device or switch is in proper operating condition before completing other work on the system (§ [373.62 FS](#) Water conservation).
- B. All irrigation systems should be operated and maintained in accordance with the *Florida-Friendly Best*

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Management Practices for Protection of Water Resources by the Green Industries or the Florida Yards and Neighborhood program.

- C. To maintain the original performance and design integrity of the irrigation system, repair of the equipment shall minimally be done with the originally specified materials or their equivalents.
- D. Irrigation systems, including automatic rain sensor shutoff device, shall be certified by an irrigation system installation professional to be operating properly and in good repair at such time as the property may be resold.

Sec. 6.9.9 Landscape irrigation schedule.

- A. The provisions of this section shall apply to each parcel within the unincorporated areas of Marion County, except that unincorporated area lying within The Villages of Marion, FQD. Landscape irrigation within the Villages of Marion, FQD shall comply with the landscape irrigation rules and water shortage rules of the SWFWMD, pursuant to the interagency agreement between the SJRWMD and SWFWMD, dated May 19, 2009.
- B. When Daylight Savings Time is in effect, landscape irrigation shall occur only in accordance with the following irrigation schedule:
 - (1) Residential landscape irrigation at odd numbered addresses may only occur on Wednesday and Saturday and must not occur between 10:00 a.m. and 4:00 p.m. daily.
 - (2) Residential landscape irrigation at even numbered addresses or no address may only occur on Thursday and Sunday and must not occur between 10:00 a.m. and 4:00 p.m. daily.
 - (3) Nonresidential landscape irrigation may occur only on Tuesday and Friday and shall not occur between 10:00 a.m. and 4:00 p.m.; and
 - (4) No more than 0.75 inches of water may be applied per irrigation zone on each day that irrigation occurs, and in no event shall irrigation occur for more than one hour per irrigation zone on each day that irrigation occurs.
- C. When Eastern Standard Time is in effect, landscape irrigation shall occur only in accordance with the following irrigation schedule:
 - (1) Residential landscape irrigation at odd numbered addresses may occur only on Saturday and shall not occur between 10:00 a.m. and 4:00 p.m.; and
 - (2) Residential landscape irrigation at even numbered addresses or no address may occur only on Sunday and shall not occur between 10:00 a.m. and 4:00 p.m.; and
 - (3) Nonresidential landscape irrigation may occur only on Tuesday and shall not occur between 10:00 a.m. and 4:00 p.m.; and
 - (4) No more than 0.75 inches of water may be applied per irrigation zone on each day that irrigation occurs, and in no event shall irrigation occur for more than one hour per irrigation zone on each day that irrigation occurs.
- D. Exceptions to landscape irrigation schedules listed above include:
 - (1) Irrigation using a micro-spray, micro-jet, drip or bubbler irrigation system is allowed anytime.
 - (2) Irrigation of new landscape is allowed at any time of day on any day for the initial 30 days and every other day for the next 30 days for a total of one 60 day period, provided that the irrigation is limited to the minimum amount necessary for such landscape establishment.
 - (3) Watering in of chemicals, including insecticides, pesticides, fertilizers, fungicides, and herbicides when required by law, the manufacturer, or best management practices is allowed anytime within 24 hours of application. Watering in of chemicals shall not exceed ¼ inches of water per application except as otherwise required by law, the manufacturer, or best management practices.
 - (4) Irrigation systems may be operated anytime for maintenance and repair purposes not to exceed 20 minutes per hour per zone.

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- (5) Irrigation using a hand-held hose equipped with an automatic shut-off nozzle is allowed anytime. The use of a hose-end sprinkler is not considered hand watering.
- (6) Discharge of water from a water-to-air air-conditioning unit or other water-dependent cooling system is not limited.
- (7) The use of water from a reclaimed water system is allowed anytime. For the purpose of this paragraph, a reclaimed water system includes systems in which the primary source is reclaimed water, which may or may not be supplemented from another source during peak demand periods.
- (8) The use of recycled water from wet detention treatment ponds for irrigation is allowed anytime provided the ponds are not augmented from any ground or off-site surface water, or public supply sources.

Sec. 6.9.10 Licensing and Certification.

A. Irrigation Professionals

- (1) Irrigation Design Professionals shall be design professional as licensed by the State of Florida to provide such professional services.
- (2) Irrigation Installation and Maintenance Professionals shall include Plumbing Contractors and Irrigation Specialty Contractors licensed by the State of Florida, and Irrigation Contractors licensed by Marion County.
- (3) Irrigation Installation and Maintenance Professionals, as defined by this section, shall be exempt from the separate licensing requirements for Irrigation Design Professionals when designing irrigation systems, or portions of irrigation systems, as part of a “design/build” contract to install or maintain the same system, if that system complies with all applicable requirements of this ordinance and is permitted by Marion County.

B. Training.

- (1) Unless otherwise subject by Florida Statutes to certain continuing education requirements, contractors licensed to perform work under this section shall annually complete a minimum of four professional development hours (PDH) in Florida-Friendly Landscaping and Irrigation practices from a continuing education organization designated by the Marion County Licensing Board.
- (2) Marion County shall confirm compliance with these PDH requirements at the time of license renewal, or by an approved audit procedure.

Division 10 Karst Topography and High Recharge Areas

Sec. 6.10.1 Purpose and Intent.

Marion County is uniquely situated in a geologic area featuring limestone and rock characteristics identified as karst, promoting the quick and rapid movement of water between the surface and the aquifer. As the aquifer is the vital source of Marion County’s potable water, as well as much of the State of Florida, its protection and preservation is essential.

Sec. 6.10.2 General Requirements.

- A. An application for any new development or expansion of existing development, located within a high recharge or karst sensitive area as designated by the appropriate water management district or Marion County maps, shall submit an analysis of site conditions in sufficient detail to define hydrologic and geologic conditions which may guide mining, land development, or construction activities on the proposed site.
- B. An applicant for any new development or expansion of existing development shall depict karst features on the project site and off-site within 200 feet of the project boundary.

Sec. 6.10.3 Additional Submittal Requirements.

- A. When providing a submittal for the purposes of demonstrating karst feature and high recharge area protection, the following minimal information shall be included:
 - (1) Potentiometric surface map;
 - (2) Geologic bulletins and papers specific to the project area;

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- (3) Geotechnical and hydrogeologic reports or studies, including test borings. The total number of borings shall be determined by the professional responsible for signing and sealing the study;
- (4) Assessment of sinkhole, cave, lineament, escarpment, solution pipe and other known and potential karst features; and
- (5) Engineering analysis and recommendations, including:
 - (a) Evaluation of planned site area; and
 - (b) Options and recommendations including but not limited to:
 1. Remediation or buffering;
 2. Minimization of impervious surfaces;
 3. Potential for innovative stormwater collection and protection measures including pre-treatment and shallow drainage retention areas; and
 4. Alternatives to stormwater retention basins when soil cover is inadequate to protect the Floridan aquifer.

Sec. 6.10.4 No untreated stormwater shall be directed into a karst feature.

Sec. 6.10.5 Development restrictions in high recharge and karst sensitive areas are as follows:

- A. Businesses or industries which produce, use, or store hazardous materials listed in **Section 12.7** shall prepare the proposed development plans in conformance with the requirements of **Section 12.8.3, the Florida Administrative Code**, and the requirements of this division.
- B. Non-residential uses shall be set back 200 feet from a sinkhole, unless the sinkhole is remediated or alternative design addressing water quality issues is approved.

Sec. 6.10.6 Karst Feature Remediation.

If remediation of a karst feature is proposed, the application for development must include a remediation plan containing all details for the remediation activity. A final certification documenting that the karst feature was successfully remediated in accordance with the plan shall be submitted with the final certifications for the development. The remediation plan and final certification must be signed and sealed by a Professional Engineer or Professional Geologist. Karst features remediated in compliance with this paragraph shall not be required to meet the buffer requirements of this division.

Sec. 6.10.7 Karst Feature Conservation.

All new development and expansion of existing development shall provide and maintain a permanent vegetative buffer around any sinkhole, cave, lineament, escarpment, solution pipe, and other known karst features that are not remediated. The buffer shall be entirely within a Conservation Easement. The Conservation Easement shall be clearly delineated, labeled, and described on the applicable plan, and follow the provisions in the Habitat Protection section of this Code.

- A. Buffer Width. The minimum width of the required karst buffer shall be 150 feet for karst features with a direct connection to the aquifer and 75 feet for karst features with no direct connection to the aquifer, as measured from the outermost closed contour or edge of the escarpment, as applicable, but no greater in width than the contributing watershed. These minimum buffer widths may be reduced if the applicant demonstrates either of the following:
 - (1) A narrower buffer can be calculated using the design methodology for calculating buffer width based on infiltration, as set forth in the *Applicant's Handbook for Regulation of Stormwater Management Systems*, SJRWMD 2005, as amended; or
 - (2) The lot of record is too small to accommodate permitted development in compliance with the minimum width, in which case the applicant shall, as an alternative, design and construct a stormwater control feature such as, but not limited to, a vegetated swale and/or berm that effectively prevents drainage to the karst feature.

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- B. Design Buffer Use. The karst buffer shall be maintained in permanent vegetative cover. In addition, the following shall be prohibited within the buffer:
 - (1) Buildings, pavement and other impervious surfaces, except sidewalks five feet or less wide may be permitted;
 - (2) Septic tank drainfields and any form of domestic wastewater disposal;
 - (3) Drainage retention areas; and
 - (4) Use of irrigation, fertilizers, and pesticides.
- C. Native Vegetation. The native vegetation shall be restored, preserved, and maintained to provide a buffer around sinkholes in excess of 50 feet in diameter.

Division 11 Traffic Management

Sec. 6.11.1 Purpose and intent.

This division is necessitated by the traffic impact of new developments and only applies to new or modified improvements. The County anticipates controlling the impacts and maximizing the public transportation system through engineered traffic management.

Sec. 6.11.2 Functional Classification.

For the purpose of development, operation, and maintenance, roads are classified as Arterial, Collector, or Local based on function as noted below.

- (1) Arterial roads are routes that provide service which is relatively continuous and of relatively high traffic volume, long average trip length, high operating speed, and high mobility importance.
- (2) Collector roads are routes that provide service which is of relatively moderate average traffic volume, moderately average trip length, and moderately average operating speed. This route also collects and distributes traffic between local roads or arterial roads and serves as a linkage between land access and mobility needs.
- (3) Major local roads (within large subdivisions or residential areas) are routes that connect neighborhoods with the arterial and collector road network and provide interconnection between neighborhoods. Major local roads (in rural areas) are routes that connect smaller local roads with the arterial and collector road network.
- (4) Minor local roads include all roads outside of subdivisions that are not classified as arterial, collector, or major local.
- (5) Subdivision local roads are streets located within subdivisions or neighborhoods that primarily provide access to abutting properties or properties along interconnected neighborhood streets. Generally, these streets will include cul-de-sacs, short blocks of a grid network, or other interconnected neighborhood streets.

A map showing all road classifications is available at the [Office of the County Engineer](#).

Sec. 6.11.3 Traffic Impact Analysis.

- A. A Traffic Impact Analysis is required to determine necessary mitigation and improvements to accommodate the proposed development. The design year shall include a minimum growth rate and in accordance with the established guidelines. For the purpose of determining what level of study must be completed, the following thresholds have been established.
 - (1) A Traffic Statement is required for projects generating fewer than 50 peak hour trips.
 - (2) A Traffic Assessment is required for projects generating between 50 and 99 peak hour trips. Unless the project has a four percent or more impact (percent project traffic to adopted LOS volume) on a roadway that has an existing volume/capacity (v/c) ratio of 0.80 or more, in which case a Traffic Study is required.
 - (3) A Traffic Study is required for projects generating 100 or more peak hour trips. For projects where all

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impacted roadways are below 0.50 v/c a Traffic Assessment is all that is required with the exception of those projects increasing the v/c ratio on an impacted roadway by 20 percent or more.

- B. The guidelines for each of these analyses can be found at [Office of the County Engineer](#).

Sec. 6.11.4 Access Management.

- A. All developments shall be responsible for ensuring and providing coordinated access to, from, and between the proposed development and the surrounding lands to ensure that adequate and managed access is available to the development project and the public. Residential development with more than 50 developable lots shall have at minimum two access points.

B. Cross Access (Parallel Access).

- (1) Cross access is required to reduce the use of the public street system, provide for movement between adjacent and complementary land uses, limit access to Arterial and Collector roads, and minimize full median openings. Cross access shall be shown on the plans and shall be established through a public easement.
- (2) Cross access shall be provided and constructed for all commercial, industrial, and multi-family residential development on arterial and collector roads unless it is determined by the County Engineer to not be practical or reasonable due to adjacent features, specific type of development, or the potential development of the adjacent property.
- (3) Refer to Article 7 for construction details.

C. Access to adjacent lands.

- (1) Access to adjacent unplatted land or development shall be provided by the continuation of the Major Local rights-of-way centered on section or quarter section lines, when possible, to the subdivision boundary.
- (2) Access to adjacent platted lands shall be provided at selected points, as approved by the County, by extending an existing or proposed street to the subdivision boundary.
- (3) Gated subdivisions or internal residential pods served by Major Local roads are exempt from the requirements in (1) and (2) above.

D. Access to adjacent commercial development.

Single family residential subdivisions fronting on collector or arterial roads shall provide for interconnection to adjacent non-residential development.

- E. No fence, wall, hedge, shrub, structure or other obstruction to vision, between a height of two and one-half feet and eight feet above the center line grades of the intersecting streets, shall be erected, placed or maintained within a triangle formed by the point of intersection of right-of-way lines abutting a street and/or railroad right-of-way and the points located along the right-of-way lines (use distance in table below) from the point of intersection. Refer to details in Article 7.

Table 6.11-1 Sight Triangles

USE	MINIMUM DISTANCE FROM POINT OF INTERSECTION
Residential Areas	25 Feet
Commercial Areas	30 Feet
Industrial Areas	40 Feet

Sec. 6.11.5 Driveway Access.

- A. Driveways provide the physical transition between a site and the abutting roadway. Driveways should be located and designed to minimize impacts on traffic while providing safe entry and exit from the development served. The location and design of the connection must take into account characteristics of the roadway, the site, and the potential users.

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B. General Driveway Requirements.

- (1) Each buildable lot, parcel, or tract is entitled to a driveway **unless cross access is available**.
- (2) Adjacent properties under the same ownership shall be considered as a single property for application of driveway spacing or for driveway permits. Applicants may include a request that properties be considered individually for permitting purposes but the request must be specifically included in the permit and a sketch included that details the lot configurations and driveway placement.
- (3) Driveway location and minimum spacing shall be consistent with traffic safety standards. If standards cannot be achieved, the County Engineer, or designee, can review and approve on a case-by-case basis.
- (4) Driveway width shall be subject to internal and external traffic flow considerations. The driveway width considerations include, but are not limited to, the number of lanes, the driveway geometrics, internal obstructions, and traffic safety.
- (5) Concrete mitered end sections are required for culverts when used for driveways accessing a roadway with posted speeds of 40 mph or greater.

C. Commercial Driveway Requirements.

- (1) The minimum allowed distance between a commercial driveway and the nearest intersecting roadway or driveway shall be as shown in Table 6.11-2.

Table 6.11-2 Minimum Commercial Driveway Spacing

Speed Limit (MPH)	Spacing* (Feet)
35 or less	245
36-45	440
Over 45	660

*on the same side of the road as the proposed driveway

- (2) **All driveways on corner parcels must access the lower classified road unless approved by the County Engineer.** Exceptions to the distances listed in Table 6.11-2 may be allowed if constraints exist that makes it impractical to meet those requirements but in no case shall that distance be less than what is shown in Table 6.11-3.

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Table 6.11-3 Minimum Commercial Driveway Spacing at Corner with Constraint

Median Restriction	Position	Access Allowed	Minimum Spacing (Feet)
Yes	Approaching Intersection	Right In/Out	115
Yes	Approaching Intersection	Right In Only	75
Yes	Departing Intersection	Right In/Out	230
Yes	Departing Intersection	Right Out Only	100
No	Approaching Intersection	Full Access	230
No	Approaching Intersection	Right In Only	100
No	Departing Intersection	Full Access	230
No	Departing Intersection	Right Out Only	100

- (3) Driveways on the opposite side of the road from the proposed driveway shall be shown on the plan for coordination purposes.
- (4) All commercial driveway access shall meet FDOT sight distance requirements. A note is required on Improvement Plans and Major Site Plans stating that “sight distance at driveways complies with FDOT requirements.”
- (5) The length of commercial driveways shall be designed to provide for an uninterrupted traffic flow on the public street. The driveway length shall be subject to the anticipated required stacking length of entering and exiting vehicles during the peak period in accordance with FDOT.
- (6) Commercial driveways shall be at minimum 24 feet wide within the right-of-way and have a 25 foot radius. The Office of the County Engineer may require wider driveway and radius for commercial properties with heavy truck traffic. Equivalent flare will be allowed if the projected traffic volume for the driveway is less than 600 trips per day and curb and gutter exist.
- (7) The maximum allowed commercial driveway grade is 10 percent. The maximum algebraic difference between two different grades is 12 percent.

D. Residential Driveway Requirements.

- (1) All developments with residential uses shall prohibit direct access onto a Major Local, Collector, or Arterial roadway. Individual lots shall be accessed through the use of an internal roadway network.
- (2) Driveways shall not access Major Local, Collector, or Arterial roads if alternate access is available.
- (3) Multi-family sites require adequate vehicular maneuvering area off of the right-of-way to prohibit backing out of driveway.
- (4) No driveway shall be located within the sight triangle at corners. Refer to Section 5.5.16. Driveway to corner lots shall be located no closer than the lesser of half of the lot width or 50 feet from the end of the radius. Driveway restriction areas shall be graphically shown on Final Plats for corner lots in compliance with this section.
- (5) All residential driveways shall make every effort possible to meet FDOT sight distance requirements. This

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may include relocating driveway, removing structures such as fences, and removing vegetation from the driveway owner's parcel.

- (6) The driveway radius shall be a minimum of 5' for Subdivision Local or Minor Local road and a minimum of 10' on a Major Local, Collector, or Arterial road. An equivalent flare to the specified radius will be acceptable.
- (7) The maximum allowed residential driveway grade is 28 percent. The maximum algebraic difference between two different grades is 12 percent.

Sec. 6.11.6 Construction Access/Route.

- A. For any phased development, or development within an existing residential area, a plan for the construction access and construction route to the nearest Collector or Arterial road shall be approved by the County prior to construction.
- B. Any activity excavating and removing material from a site shall include a designated access route and be approved by the County prior to utilization.

Sec. 6.11.7 Loading Areas.

The arrangement of truck loading and unloading facilities for commercial development shall be such that in the process of loading or unloading, no truck shall block or impact the flow of traffic on any adjacent street. The engineer shall state or show on the plans the proposed loading and unloading arrangement.

Sec. 6.11.8 Parking Requirements.

- A. Alternatives to these parking standards may be accepted by the Planning/Zoning Manager, if the applicant demonstrates that such standards better reflect local and project conditions.
- B. Number of Spaces.
 - (1) Parking spaces for residential and non-residential developments shall be provided consistent with tables 6.11-4 and 6.11-5.
 - (2) A one-car garage or carport and driveway combination shall count as two off-street parking spaces provided the driveway measures a minimum of 25' in length between the face of the garage or carport door and the sidewalk, or 30' to the curb line.
 - (3) A two-car garage or carport and driveway combination shall count as four off-street parking spaces, provided the minimum width of the driveway is 20' and its minimum length is as specified above for a one-car garage or carport.
 - (4) For mixed-use developments, a shared parking approach to the provision of off-street parking shall be permitted.
 - (5) Any change of use on a site to a use which requires more parking spaces than are provided on the site shall require submission of an appropriate site plan showing the required parking spaces.

Table 6.11-4 Minimum Off-Street Parking Requirements for Residential Land Use

Housing Unit Type and Size	Off-Street Parking Requirements
Single-Family Detached	
up to 3 Bedrooms	2.0
4 or 5 Bedrooms	3.0
Multi-family and Manufactured Home	
1 Bedroom	1.5
2 or 3 Bedrooms	2.0

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Table 6.11-5 Minimum Off-Street Parking Requirements for Nonresidential Land Use

Nonresidential Land Use	Required Off-Street Parking Spaces Per Indicated Area*	
Bar	1	Per 4 seats
Bowling alley	3	Per lane
Car wash	5	Per washing lane
Church/Place of Worship	1	Per 3 seats
Elementary or Middle School	2	Per classroom; but not less than 1 per teacher & staff
Fast-food establishments	1	Per 75 sq. ft. GFA
Fiduciary institutions	1	Per 300 sq. ft. GFA
High School	5.5	Per 30 students; but not less than 1 per teacher & staff
Hotel	0.5	Per guest room, plus
	10	Per 1,000 sq. ft. GFA non-room area
Housing for handicapped, elderly, ACLF, nursing homes, or similar uses	1	Per 3 beds, plus
	0.5	Per employee
Industrial	1	Per 675 sq. ft. GFA
Library	1	Per 300 sq. ft. GFA
Manufacturing	1	Per 675 sq. ft. GFA
Medical Center	1	Per 250 sq. ft. GFA
Neighborhood or convenience center under 100,000 sq. ft. GLA	4	Per 1000 sq. ft. GLA
Nightclub	1	Per 3 seats
Offices	2.5	Per 1000 sq. ft. GFA
Research	1	Per 1000 sq. ft. GLA
Restaurant	15	Per 1000 sq. ft. GFA
Retail store	1	Per 300 sq. ft. GFA
Service station	3	Per bay & work area
Shopping center	3.5	Per 1000 sq. ft. GLA
Storage areas	1	Per 2000 sq. ft. GLA
Theater	1	Per 4 seats
Warehouse	1	Per 3000 sq. ft. GFA

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* Parking requirements for land use types that are not listed shall be based on other documentation approved by the County such as the ITE Parking Generation Manual or American Planning Association Publications.

Table 6.11-6 Minimum Accessible Parking Space Requirements

Total Number of Parking Spaces	Accessible Parking Spaces
1 to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5
151 to 200	6
201 to 300	7
301 to 400	8
401 to 500	9
501 to 1000	2 percent of total
1001 and over	20, plus 1 for each 100, or fraction thereof, over 1000

- C. Each off-street parking space shall measure, at a minimum, 9' wide by 18' long. Pavement markings in parking lots shall be a minimum of 4" wide.
- D. Disabled permit parking spaces shall be provided in compliance with the requirements of the Florida Building Code, American with Disabilities Act, and the FDOT Design Standards. A detail or label shall be provided on plans indicating that these spaces will be striped in accordance with FDOT index 17346.
- E. All off-street parking areas shall be paved for all developments, except as listed below. The following uses may use grass parking except for employee and disabled permit parking spaces which must be paved. The perimeter of a grass parking lot shall be delineated with railroad ties, wheel stops, or other means as may be approved by the County Engineer, or designee.
 - (1) Churches or other places of worship
 - (2) Private clubs or lodges
 - (3) Community centers
 - (4) New and used motor vehicle sales and leasing
 - (5) Trucks and commercial tractor/trailer units
 - (6) Sales and leasing of new and used manufactured homes
 - (7) Sales of new and used farm tractors or equipment
 - (8) New or used construction equipment
 - (9) Government buildings
 - (10) Schools
 - (11) Athletic facilities
 - (12) Park facilities
- F. Access to parking areas shall be designed so as not to obstruct free flow of traffic. There shall be adequate provision for ingress to and egress from all parking spaces to ensure ease of mobility, ample clearance, and safety of vehicles and pedestrians.
- G. Developer shall account for a two foot vehicle overhang where sidewalks are located in front of a parking

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space. Wheel stops can be used to prevent the vehicle overhang over the sidewalk and maintain the intended walkway width.

- H. Parking areas shall be suitably landscaped in accordance with **Section 8.2.10.i.(5)**.
- I. The width of all aisles providing direct access to individual parking stalls shall be in accordance with Table 6.11-7.

Table 6.11-7 Minimum Aisle Width Requirements

Parking Angle (degrees)	Aisle Width, One-way Traffic (feet)	Aisle Width, Two-way Traffic (feet)
30	12	22
45	13	22
60	18	22
90	24	24

Sec. 6.11.9 Traffic Control Devices.

A. Traffic Signals

- (1) The installation of a traffic signal requires a signal warrant analysis to be performed. The County’s Traffic Engineer shall determine if the signal warrant analysis justifies the need for a traffic signal. Traffic signals warranted due to the development shall be installed and paid for by the developer.
- (2) Justification must be provided for the left turn treatment, phases, deceleration lane lengths and timings proposed.
- (3) In addition to the plan requirements listed below, shop drawings with FDOT approved materials and a maintenance agreement must be provided and approved.
- (4) Illuminated Street Name signs shall be required at all signalized intersections.
- (5) A box-span configuration is required if strain poles are used.
- (6) Traffic signal plans shall be 11”X 17” and shall include the following.
 - (a) A Key sheet including the name of the intersecting roads, an index, a location map, a list of the utility companies that exist in the location of the signal, and the posted speeds of the approaching roadways.
 - (b) A Tabulation of Quantities sheet that lists the item numbers, description and quantity of materials and equipment, listed in numerical order. Pay item notes and general notes that refer to item numbers shall be shown on this sheet.
 - (c) A General Notes sheet including all general notes, related to the specific signal, as required by the Traffic Section of the Marion County Office of the County Engineer. Contact the Office of the County Engineer for the current required general notes.
 - (d) A Plan sheet at a scale large enough to show all details clearly and legibly. The recommended scale is 1” = 40’ or 1” = 50’. The plan sheet shall include existing and proposed:
 - 1. Edge of pavement
 - 2. Street names
 - 3. Drainage structures including curb and gutter and drainage inlets
 - 4. Sidewalks and right-of-way lines
 - 5. Pavement markings
 - 6. Signal heads with directional arrows and movements (movement 2 and 6 shall be the major

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streets)

7. Detection devices such as video detection with detection field or loop detection with conduit locations
8. Pull boxes
9. Control cabinet location
10. Signal poles and span wire
11. ATMS Equipment (if applicable)
12. North arrow and scale
13. Phasing Diagram
14. Controller timings using calculated optimum timings and clearance intervals meeting FDOT requirements
15. Sign detail with dimensions of letters and sign
16. Signal head details
17. Pedestrian head details
18. FDOT pay item numbers for all equipment

(e) A structural analysis with soil boring data signed and sealed by an Engineer.

B. Traffic Signs.

- (1) The Developer's Project Engineer shall design the project plans providing for installation of signs as per the requirements of this Code and the MUTCD.
- (2) Street Name signs at every roadway intersection are required.
- (3) Stop signs and stop bars are required on the minor street at all intersections. Yield signs may be permitted if approved by the County Traffic Engineer.
- (4) Speed Limit signs are required at subdivision entrance roads and all locations where speed zones change. The speed limit shall be determined by the Project Engineer in accordance with FDOT policies. A speed limit resolution is required when the posted speed differs from the statutory speed.
- (5) Curve and Advisory Speed signs shall be installed as recommended by MUTCD.
- (6) Dead End signs shall be erected at the beginning intersection of all discontinuous roads. No Outlet signs shall be erected at the entrance intersection when this intersection is the only outlet from a street network.
- (7) Delineators shall be installed at the ends of all cross drain culverts in accordance with **construction details in Appendix B.**

C. Pavement Markings.

Pavement markings shall be installed in accordance with the MUTCD and as approved by the County Engineer. Stop bars shall be required at every intersection approach where stop signs are located. A minimum of 200 feet of double solid yellow striping extending back from the stop bar is required on all paved roads or entrances that intersect with an Arterial, Collector, or Major Local road. All pavement markings in County right-of-way shall be thermoplastic, except bicycle lane markings which shall be paint. All centerline, lane line, and edge-line striping shall be six inches wide on Arterial, Collector, and Major Local roads; and a minimum of four inches on other classified roads. **For commercial driveways, a Stop sign and stop bar shall be provided when the projected vehicle traffic is 25 vehicles per hour or greater;** a four inch wide centerline pavement marking shall be provided when the projected traffic is 600 vehicles per day or greater.

Division 12 Transportation Facilities

Sec. 6.12.1 Purpose and Intent.

All improvements that will be located within the public or private right-of-way or easement, such as new roads,

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new signals, auxiliary turn lanes, sidewalks, trails, golf cart paths, pedestrian paths and other public transportation facilities, shall be designed to the “FDOT Greenbook” and “FDOT Design Standard Index” unless noted differently herein.

Sec. 6.12.2 Right-of-Way.

- A. When a subdivision is being platted, right-of-way shall be dedicated for internal streets and adjacent roads to provide the minimum width specified in the table below.
- B. For Major Site Plans, when improvements related to the project are in the right-of-way, right-of-way shall be dedicated along adjacent roads to provide the minimum width specified in the table below. The existing centerline of the adjacent road shall be the reference line used to determine the needed right-of-way on each side of said centerline. This right-of-way can be provided by dedication or easement. The dedication provided herein shall only be required to the extent that such dedication is mandated by the project demands.
- C. In the urban area, right-of-way shall also be dedicated along section and quarter section lines, or as directed by the DRC, if future roadway corridors are contemplated in the Comprehensive Plan and/or the Transportation Planning Organization (TPO) long range plan.
- D. If the required right-of-way is not directly necessitated by the proposed development to mitigate traffic impact, in accordance with the project’s traffic impact analysis, the owner may be compensated based on the fair market value if acceptable to both the owner and the County. Compensation may be in the form of impact fee credits and is subject to the approval of the Board.

Table 6.12-1 Minimum right-of-way widths

Road Classification	Width
Subdivision Local (private)	50' + 5' ROW easement each side
Subdivision Local (public)	60'
Minor Local	80'
Major Local	100'
Collector, Arterial (urban)	120'
Collector, Arterial (rural 2-lane undivided)	120'
Collector, Arterial (semi-urban)	150'
Collector, Arterial (rural divided)	180'

Sec. 6.12.3 Typical Sections.

- A. All roadway improvements shall meet the minimum requirements given in the table below and be in concurrence with the additional tables in this division. Typical sections are detailed cross section depictions of the highway's principal elements that are standard between certain station or milepost limits. These sections are the basis for construction details and information shown on the various plan sheets.

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Table 6.12-2 Typical Section Minimum Requirements

Street Design Type	Lane Width	Median Width	Bike Lane	Shoulders		Sidewalks (if required)
				Paved	Grass	
2-lane urban subdivision local	10'	-	-	-	-	5'
2-lane rural subdivision local	10'	-	-	-	4'	5'
2-lane rural minor local	11'	-	-	-	6'	-
2-lane urban major local	12'	-	4'	-	-	5'
2-lane rural major local	12'	-	-	2'	6'	5'
2-lane urban collector/arterial	12'	40'	4'	2'*-	6'*	5'
2-lane rural collector/arterial (undivided)	12'	-	-	2'	6'	-
2-lane rural collector/arterial (divided)	12'	56'	4'	-	4'	-
				2'*	6'*	
4-lane urban collector/arterial	12'	20'	4'	-	-	5'
4-lane semi-urban collector/arterial	12'	22'	4'	2'*	4'	5'
4-lane rural collector/arterial	12'	32'	4'	-	4'	-
				2'*	6'*	

Notes:

- 1) This table applies for new construction. Maintenance and rehabilitation projects shall attempt to satisfy these requirements as deemed practical.
- 2) Refer to details in Article 7 to review the Typical Sections.
- 3) A dash (-) indicates the element is not required.
- 4) Sidewalks shall be 6' wide if adjacent to the back of the curb.
- * Median Shoulder.

- B. Typical sections shall show typical conditions only. Existing elements that are to be incorporated into the highway's final section are depicted in conjunction with the proposed elements.
- C. Typical section stationing shall cover the entire project. Transitions from one typical to another shall be included in the stationing of one or the other typical section.
- D. Typical sections for all projects shall include the following data:
 - (1) Cross slopes of roadway pavement, shoulder surfaces, and sidewalks shall be expressed as a decimal part of a foot vertical per foot horizontal. These cross slopes shall be rounded to two decimal places. Outer slopes shall be shown by ratio, vertical to horizontal.
 - (2) Feathering details and/or notes shall be shown when resurfacing without milling in urban curb and gutter sections as specified or when milling depth is less than the overlay thickness.
 - (3) Profile grade point shall be identified when applicable.
 - (4) Pavement construction shall be described in a clear, precise manner by indicating the LBR requirement and the thickness of the subgrade stabilization, subbase or base, as well as thickness for structural course, friction course and shoulder pavement. Use 4 inches for both base extension on rural sections and for stabilization extension on curbed sections. Pavement structure information shall be obtained from the approved pavement design and shall be described in the order of construction, i.e. starting with bottom layer and ending with friction course. Show pavement thickness descriptions for top, leveling, structural, and friction courses in inches (and fractions of an inch). The thickness shown should be to the nearest 1/2" (except for FC-5 which is a standard 3/4").

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- (5) Limits of grassing.
- (6) Sidewalk location and width.
- (7) Curb and gutter location and type.
- (8) Limits of clearing and grubbing, where applicable.
- (9) Right-of-way and/or easements, where applicable.
- (10) For widening projects, the existing pavement width shall be shown as a +/- dimension, and the base widening width shall be shown with an asterisk. For typical sections with varying dimensions, the dimensions shall be clearly indicated on the plan-profile sheets.
- (11) Shoulder treatment shall be identified.

Sec. 6.12.4 Plan and Profile.

- A. The roadway plan sheet shows the project's complete horizontal alignment. The plan-profile sheet shows the project's complete horizontal and vertical alignments. Various roadway elements such as pavement width, medians, paved shoulders, curbs, drainage elements, tapers, turn provisions, and intersecting roadways, are also shown on these sheets.
- B. Plotting should typically be done at a horizontal scale of 1" = 50'.
- C. The baseline survey and/or centerline of construction should be centered in the plan portion of the sheet, with stationing running from left to right. For resurfacing projects, simple projects, or sections of a project without a profile view, "stacking" multiple plans on one sheet is generally permitted if clarity and legibility are maintained. PC and PT points of horizontal curves shall be indicated.
- D. All existing topography shall be shown, including but not limited to existing roads, streets, drives, buildings, underground and overhead utilities, walls, curbs, pavements, fences, railroads, bridges, drainage structures and similar items shall be plotted and labeled. Streams, ponds, lakes, wooded areas, ditches and all other physical features shall also be shown.
- E. Proposed construction and project limits shall be indicated in the plans.
- F. Plan Layout
 - (1) Right-of-way lines shall be shown.
 - (2) At locations along the alignment where traveled way dimensions change, or begin to change, the station and dimensions of the traveled way shall be shown.
 - (3) Curb, curb and gutter, traffic separators, sidewalks, curb ramps, retaining walls, driveways, etc. shall be shown.
 - (4) Stations of return points shall be shown in tabular form or shown on the plan, unless shown on an intersection detail sheet. Offsets shall also be shown, if not governed by a typical.
 - (5) Station of end of curb and gutter at side street intersections (when end is not at a return point) shall be shown with proposed gutter grade elevation of these points.
 - (6) Limits of pavement and grading at side street intersections shall be indicated.
- G. Profile Layout
 - (1) The horizontal scale for the profile portion of the sheet shall be the same as that used for the plan portion. Station limits of the profile shall correspond to those of the plan portion of each sheet. Station numbers shall be placed across the bottom of the sheet. Intervals for profile stations shall be the same as those in the plan view.
 - (2) A general guideline is the vertical scale should be 10% of the horizontal grid. Elevation datum shall be shown.
 - (3) The existing ground line profile shall be shown and labeled. Existing ground line elevations shall be noted vertically, just above the station numbers at each end of the sheet only.
 - (4) All high water elevations affecting base clearance or roadway grades shall be shown and labeled.

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(5) Benchmark data shall normally be given just below the upper margin of the profile portion.

H. Utilities, including drainage, shall be provided as follows:

- (1) All existing and proposed utilities shall be shown on the plan and labeled properly.
- (2) Proposed stormwater systems, water and sewer lines, and gas lines shall be shown on the profile with invert elevations at every inlet or manhole or at top of pipe elevations every 500' intervals, as appropriate.
- (3) When using stationing, all design features and utilities shall be referenced with station and offset information.

Sec. 6.12.5 Cross Sections.

- A. The interval selected for showing sections on the cross section sheet will vary according to project specific factors. For new construction and reconstruction, the normal interval for cross sections is 100' and at all utility, including drainage, crossings. For new subdivision construction projects, at the discretion of the County Engineer, or designee, the number of required cross sections may be reduced or eliminated when sufficient construction information meeting the intent of this Code is shown on the plan and profile.
- B. Cross sections shall depict the existing ground conditions, including all manmade features, as sections perpendicular to the respective stations along the survey baseline or construction centerline. The proposed cross-sectional outline of the new facility with all its functional elements shall also be shown on cross sections. The existing and proposed elevation at the centerline shall be noted. The station number of the section shall be indicated.
- C. Existing parallel underground utilities which lie within the horizontal limits of the project shall be shown. Utilities that have been verified should be labeled. Small distribution or service lines need not be shown.
- D. The proposed roadway template and the proposed profile grade elevation shall be shown.
- E. The right-of-way and construction limits shall be shown for each cross section.
- F. The begin and end stations for project, construction, exceptions, bridge/bridge culvert and the toe of slope under the bridge shall be shown. The beginning and ending earthwork stations shall be shown.

Sec. 6.12.6 Roadway flooding level of service

- A. Subdivision Local and Minor Local Roads. Flooding due to the 25-year storm design high water level shall be below one-half of the travel lane. For internal flood evacuation routes, flooding due to the 100-year storm design high water level shall be below one-half of the travel lane. Further restrictions may be imposed by the County Engineer, or designee, for flood prone areas.
- B. Arterial, Collector, and Major Local Roads. All roads shall be designed to be above the 100-year storm design high water level for that basin. Flooding due to this event shall not encroach into the travel lane.

Sec. 6.12.7 Pavement Sections

All roadway improvements shall meet the minimum requirements given in the table below.

Table 6.12-3 Minimum Pavement Design

Road Classification	Pavement (Type S or SP) as approved by the project engineer	Limerock Base (LBR 100)	Stabilized Subgrade (LBR 40)	Structural Number
Subdivision Local	1.25"	8"	12"	2.95
Minor Local	1.50"	10"	12"	3.42
Major Local	1.50"	10"	12"	3.42
Collector*	2.50"	10"	12"	3.86
Arterial*	3.50"	10"	12"	4.30

* Pavement design shall be in accordance with FDOT.

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Sec. 6.12.8 Soil Data.

Soil test borings are required for all roadway improvements as indicated below. If it is determined that an organic or plastic material must be removed below the finished grading template, the lower limits of removal of organic or plastic material shall be shown to determine the area and volume of subsoil excavation.

- (1) Auger boring depth shall be a minimum of four feet below proposed finish grade or six feet below natural grade, whichever is the deepest.
- (2) Spacing of borings shall be at a maximum interval of 600 feet along the roadway centerline.
- (3) A minimum of two soil test borings per roadway, taken within the road right-of-way are required.

Sec. 6.12.9 Subdivision Roads and Related Infrastructure.

- A. In residential subdivisions, the road system shall be designed to serve the needs of the neighborhood and to discourage use by truck traffic and through traffic and still provide access to adjacent neighborhoods for emergency services. The use of neighborhood traffic calming devices such as traffic circles, cul-de-sac, etc. are encouraged in residential areas.
- B. Major local roads shall be identified on plans.
- C. All roads and related infrastructure within the proposed subdivision shall be designed, constructed, and paved to County specifications provided herein.
- D. The developer shall be required to design, construct, and pave to County specifications, one road from the subdivision to the nearest paved, public roadway with legal access, if such a road does not already exist.
- E. Roads and stormwater facilities within a subdivision shall be dedicated as either public or private.
- F. Public dedications shall be pre-approved by the Development Review Committee. If a MSBU is established as the maintenance and operation entity, roads and stormwater facilities can be platted as public.
- G. Cul-de-sac diameters to the right-of-way line shall not be less than 120' with a pavement radius of 40' for residential subdivisions and shall not be less than 120' to the right-of-way line with a pavement radius of 45' for commercial or industrial subdivisions (refer to detail in Article 7). A grassed island no greater than 50' in diameter may be constructed in the center of a cul-de-sac.
- H. Dead end roads shall not exceed 1,500' and shall have a cul-de-sac at the terminal end (refer to detail in Article 7). Dead end roads intended to provide future access to adjacent unplatted areas may be permitted without a cul-de-sac provided that no lots front thereon, the length does not exceed 1,500', and appropriate temporary end-of-road markers are provided.
- I. The total perimeter of a block shall not exceed 4,500'. Larger block perimeters will be permitted for blocks surrounding or adjacent to natural or artificial features such as lakes, rivers, and golf courses where limiting block lengths are not feasible and impractical.
- J. Corner radii at the intersection of the two rights-of-way shall be not less than 25'. Minimum pavement radii shall be 40' for residential subdivisions and 50' for commercial or industrial subdivisions.
- K. Centerline radii shall be designed to accommodate the minimum design speed of 30 mph for subdivision local and minor local roads, 40 mph for major local and collector roads, and 45 mph for arterial roads in accordance with FDOT and AASHTO Standards.
- L. Evacuation routes for developments shall be indicated on the improvement plans.

Sec. 6.12.10 Intersection Layout.

- A. Roadways shall intersect at approximately right angles. Opposing streets shall have horizontal and vertical alignments in accordance with FDOT standards.
- B. Roadway access location and minimum spacing shall be consistent with traffic safety standards. If standards cannot be achieved, the County Engineer, or designee, can review and approve on a case-by-case basis.
- C. All median openings shall be designed in accordance with FDOT Median Opening Handbook.
- D. All intersection users shall be accommodated including pedestrians and bicyclists.

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Sec. 6.12.11 Turn Lanes.

Turn lanes shall be required as warranted by the project's Traffic Impact Analysis and in accordance with FDOT or as approved by the County Engineer. In addition, turn lanes shall be considered any time an unsafe condition exists or will be created. The cost of construction of such lanes shall be the responsibility of the developer. Additional right-of-way may be required and shall be dedicated by the developer and shown on the Improvement Plans and Final Plat. Any off-site improvement designs shall be submitted as an Improvement Plan application.

Sec. 6.12.12 Sidewalks.

- A. Sidewalks shall be provided in the **Urban Area, Rural Activity Centers, and Specialized Commerce Districts** along arterial, collector, and major local streets where these streets adjoin the project and minimally along one side of the internal streets. Sidewalks shall be constructed with all-weather surfaces and shall meet Americans with Disabilities Act, Florida Building Code, and FDOT Design Standards.
- B. Sidewalks outside the right-of-way and independent of the street system are encouraged as an alternative to sidewalks parallel to a roadway, provided equivalent pedestrian needs are met.
- C. The sidewalk system shall provide connectivity between existing and proposed developments.
- D. At the discretion of the Development Review Committee, in lieu of construction along external streets, the developer may pay a sidewalk fee to the County in an amount necessary to complete construction. This amount shall be determined by the project engineer and approved by the County with payment required prior to final plan approval. The County may use these funds toward the construction of sidewalks throughout the County based on priorities established by the Board.

Sec. 6.12.13 Utility Position in Right-of-Way.

Utilities, when constructed in the right-of-way, shall be positioned in accordance with construction details in **Article 7**. Work within a public right-of-way shall be subject to a Right-of-Way Utilization Permit issued by the Office of the County Engineer.

Sec. 6.12.14 Street Lighting.

- A. Street lighting, if provided, shall be in accordance with a plan designed by the utility company, or using the Illuminating Engineering Society of North America (IESNA) Lighting Handbook, current edition.
- B. An individual, homeowner's association or other legal entity shall be responsible for care, maintenance and costs of street lighting.
- C. Spacing of light poles or posts shall conform to the standards in the IESNA Lighting Handbook, current edition.
- D. The height and shielding of lighting fixtures shall provide proper lighting without hazard to drivers or nuisance to residents in accordance with **Division 19**.

Division 13 Stormwater Management

Sec. 6.13.1 Purpose and intent. The purpose of this division is to provide stormwater guidelines and design criteria to reasonably protect the public from uncontrolled stormwater runoff which causes flooding, pollution, erosion, and sedimentation.

Sec. 6.13.2 Minimum requirements.

- A. Plan sheets shall minimally show:
 - (1) All pre-development and post-development basins that contribute runoff to the area proposed for development, including all off-site contributions, and areas that may be impacted by the development fully delineated and quantified.
 - (2) The time of concentration, and travel path, for each watershed.

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- (3) The location and design parameters for all retention/detention areas including:
 - (a) Dimensions or coordinates for constructability.
 - (b) Cross sections, to scale, along the width and length of each pond, showing the design high water elevation, estimated seasonal high water elevation, pond top elevation, pond bottom elevation, side slope steepness, maintenance berm width, sod stabilization of the pond side slopes, and appropriate vegetative cover on the pond bottom. A typical cross section can be used instead when sufficient information is shown on the plan view which minimally includes pond width and length call outs as measured at the pond's top and bottom elevations.
 - (c) Soil boring location with labels.
 - (4) All stormwater features or connective elements located and identified that may have an impact on the existing or proposed system, including but not limited to cross-drains, natural weirs, water line of lakes, wetlands, rivers, springs, streams, canals and other manmade or natural features.
 - (5) All existing and proposed stormwater structures located and identified including labels and design parameters such as, references to a detail or source, widths, depths, heights and pertinent elevations.
 - (6) All existing and proposed stormwater pipes located and identified including labels and design parameters such as, sizes, materials, lengths, slopes, references to a detail or source, and invert elevations.
 - (7) All existing and proposed swales located and identified including labels and design parameters such as, side slope steepness, widths, dimensions, ditch block locations and details, stabilization, and material used to stabilize.
 - (8) Minimum finished floor elevations a minimum of one foot higher than the one percent (100-year) flood elevation.
 - (9) Site access accounting for stormwater conveyance with a swale, culvert, or curb and gutter driveway.
 - (10) Site grading, using spot grades at all corners and other critical or transitional locations, with directional flow arrows, details, cross sections, or general grading depictions.
 - (11) Erosion control measures, including:
 - (a) The construction entrance location and controls;
 - (b) Limits of silt fence, turbidity barrier, and other perimeter or intermediate controls; and
 - (c) References to a detail or source.
 - (12) Details, cross sections, or references clearly describing the construction intent. It is acceptable to reference standard details, such as FDOT's, when used instead of reproducing them.
- B. Calculations shall minimally include:
- (1) Runoff analysis that reflects the project basin soil type, area, and ground cover based on pre-conditions and post-conditions for ultimate development.
 - (2) Time of concentration and travel time analysis for hydrology and hydraulic systems.
 - (3) Soil boring parameters including the confining layer elevation, estimated seasonal high water elevation, porosity, and permeability rates as justified in the geotechnical investigation report.
 - (4) Hydrologic stormwater model analysis including all input parameters, supporting calculations, assumptions, documentation for design and results.
 - (5) Hydraulic stormwater model analysis including all input parameters, supporting calculations, assumptions, documentation for design and results.
 - (6) A minimum freeboard of six inches shall be provided for all retention/detention areas.
 - (7) Recovery analysis based on drawdown of the total required volume.
 - (8) Calculations must be consistent with the plan sheets and other supporting details. Calculations shall use standard methodology recognized in the State of Florida, including hand and/or computerized calculations.
- C. Geotechnical investigation report shall minimally include:

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- (1) A summary of all subsurface exploration data and subsurface soil profiles.
- (2) Exploration logs, laboratory or in situ test results, groundwater information, the interpretation and analysis of the subsurface data.
- (3) Recommendations for design, discussion of conditions for solution of anticipated problems, and recommended geotechnical special provisions.

Sec. 6.13.3 Types of stormwater management facilities.

A. Existing public

- (1) An adjacent public retention/detention area may be utilized for disposal of runoff generated by an applicant's improvements if it can be proven that capacity is sufficient.
- (2) A Stormwater Connection Application is required for any connection to or expansion of a County retention/detention area, including but not limiting to drainage retention/detention areas or conveyance systems, not previously designed or permitted to consider the applicant's improvements.
- (3) If the retention/detention area is still under a maintenance agreement, approval in writing must be received from the maintenance entity, when not the County, stating no objection to the use of the facility.

B. Natural

- (1) A natural facility may be used without further excavation upon the applicant's submittal of calculations demonstrating the existing capacity is sufficient.
- (2) Proof of control, ownership or easement for operation and maintenance of the natural facility shall be provided.
- (3) Runoff from adjacent property, to a natural facility, must be perpetuated to the extent of protecting upland owner interest.

C. Proposed public

- (1) Retention/detention areas shall have side slopes no steeper than 4:1 (horizontal: vertical) with a minimum berm width of 12' stabilized at six percent grade maximum around the entire perimeter of the facility. Side slopes steeper than 4:1 may be allowed with additional accommodations related to public safety, maintenance, and access upon approval by the County Engineer or designee.
- (2) Stormwater management systems servicing a public development shall be owned and maintained by Marion County. They may be privately owned and maintained, upon approval by the County Engineer and granting of an easement to Marion County, minimally allowing but not obligating, emergency maintenance, as well as access to, drainage of, conveyance of, and storage of stormwater.
- (3) If fencing is used, it shall be per the County detail found in Article 7.
- (4) The bottom of all dry water retention areas shall have appropriate vegetative cover.

D. Proposed private

- (1) Residential subdivisions. Retention/detention areas shall have side slopes no steeper than 4:1 (horizontal: vertical) with a minimum berm width of 12' stabilized at six percent grade maximum around the entire perimeter of the facility. Side slopes steeper than 4:1 may be allowed with additional accommodations related to public safety, maintenance, and access upon approval by the County Engineer or designee.
- (2) Commercial lots or subdivisions. Retention/detention areas shall be designed with a minimum berm width of 5' stabilized at six percent grade maximum around the entire perimeter of the facility and side slopes:
 - (a) No steeper than 4:1 (horizontal: vertical); or
 - (b) Steeper than 4:1 with an access path provided to the bottom of the facility at a slope of no steeper than 3:1; or
 - (c) As vertical walls with a structural detail for the wall design provided, adhering to Florida Building Code, an access path provided to the bottom of the facility at a slope of no steeper than 3:1, and an appropriate barrier provided when adjacent to vehicular paths and parking areas.

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(3) The bottom of all dry water retention areas shall have appropriate vegetative cover.

Sec. 6.13.4 Stormwater quantity criteria.

- A. Methodologies, rainfall distribution and intensities shall be consistent with those approved by the governing water management district. Assumed parameters must be supported by conventional methods.
- B. Design storms shall consider open or closed basins as provided in Table 6.13-1.

Table 6.13-1 Design Storms and Discharge Conditions

Basin	Frequency Duration	Discharge Rate	Discharge Volume
Open Basin	25-year 24-hour	Post ₂₅ less than or equal to Pre ₂₅	Post ₂₅ less than or equal to Pre ₂₅
Closed Basin	25-year 24-hour and 100-year 24-hour	Post ₂₅ less than or equal to Pre ₂₅ and Post ₁₀₀ less than or equal to Pre ₁₀₀	Post ₁₀₀ less than or equal to Pre ₁₀₀
Closed Basin w/downstream flooding*	25-year 24-hour and 100-year 24-hour	0 cfs	0 cf

*Downstream flooding is that flooding observed and validated by the County.

C. Discharge conditions

- (1) All stormwater facilities shall be designed to limit discharges considering open or closed basins per Table 6.13-1.
- (2) Discharges shall mimic the pre-development condition, match the pre-development location and not exceed the pre-development rate, except when discharging into a stormwater system designed to accept such discharges.
- (3) The bypass or discharge of offsite runoff, shall be allowed when it mimics the pre-development condition, matches the pre-development location and does not exceed the pre-development rate, except when discharging into a stormwater system designed to accept such discharges.
- (4) In closed basins with downstream flooding, existing improvements may be included in the pre-development calculations when all of the following apply:
 - (a) The existing improvements were constructed as part of a development with a permitted stormwater system or constructed prior to stormwater permitting requirements;
 - (b) Discharge from the existing improvements are into a private system designed to accept such discharges or a public system; and
 - (c) There is no adverse impact downstream including, but not limited to, flooding of structures or hindering of access.
- (5) A discharge structure shall be required for all retention/detention areas not designed to retain the entire 100-year 24-hour post-development design storm.
- (6) Discharge structures shall include a skimmer at a minimum. Design elements such as baffles or other mechanisms suitable for preventing oils, greases, and floating pollutants from discharging out of the facility shall be considered. When discharging from a natural facility, a skimmer may not be required upon approval from the County Engineer or designee. When a grassed weir is used it shall be constructed with a

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hard core center or geoweb.

D. Recovery.

- (1) All retention/detention areas shall recover the total volume required to meet the discharge volume limitations within 14 days following the design rainfall event.
- (2) For retention/detention areas not able to recover the total required volume within 14 days, the stormwater facility volume shall be increased to retain an additional volume of the post minus pre difference in runoff for the 25-year 24-hour design storm when in an open basin or for the post minus pre difference in runoff for the 100-year 24-hour design storm when in a closed basin. The control elevation for retaining this volume shall be no greater than the top of constructed stormwater facility or the easement limits of a natural facility. Credit for the recovered volume through the 14 day duration may be considered to meet this requirement.

E. Infiltration or percolation can be considered when establishing the design high and discharge elevation.

F. Other design criteria may be used if approved by the County Engineer or designee.

Sec. 6.13.5 Flood plain and protection.

- A. This section provides requirements for all land use activities, including single family residences, which materially change the location, elevation, size, capacity, or hydraulic characteristics of the existing one percent (100-year) flood plain as identified by the Federal Emergency Management Agency (FEMA). The intent is to ensure that equivalent flood plain volume and conveyance is maintained. This section also supplements Division 5.3 Flood Plain Overlay Zone.
- B. Land use activities which materially change the flood plain may be permitted when calculations performed by a licensed professional are provided demonstrating that compensating storage or other hydraulic characteristics are provided on the owner's property or within an easement. The calculations shall be reviewed and approved by the County Engineer or designee.
- C. Land use activities that do not meet the thresholds for a stormwater analysis shall minimally be required to demonstrate one-for-one compensating storage, to be reviewed and approved by the County Engineer or designee.
- D. When proposed improvements encroach into a flood hazard zone, it shall be necessary for the applicant to file a map amendment or revision with FEMA.

Sec. 6.13.6 Stormwater quality criteria.

- A. Methodology. Stormwater management systems may be designed using a combination of design techniques ranging from traditional to low impact. The method(s) utilized shall focus on enhancing the quality of stormwater discharge and recharge through shallow systems, the processes of adsorption, filtration, denitrification, ion exchange, nutrient uptake, microbial activity, and decomposition.
 - (1) Exemptions.
 - (a) Sites less than ten acres with an industrial use, as defined by North American Industry Classification System. Larger size exemptions will be considered through the waiver process.
 - (b) Existing commercial parcels two acres in size or less. This exemption shall only apply if the parcel is a parcel of record, with the appropriate land use and zoning, on or before the original adoption of the Springs Protection Ordinance 09-17 dated 06/02/09. Land use changes and rezonings that occur after this date which create a parcel two acres or less are not exempted.
 - (2) Transportation facilities. Public transportation projects that have a contributing drainage area comprised mostly of the road right-of-way and non-developed natural areas are not considered significant contributors of nutrients and shall meet the water quality standards of the governing state agency. Public transportation projects in urbanized or developed areas shall be evaluated for their nutrient loading impact and designed accordingly. Transportation facilities provided as part of a development shall meet the water quality requirements set forth in this Code unless it is clearly demonstrated that drainage is not received

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from parcels within the development.

(3) The following systems shall be considered as meeting the County's stormwater quality criteria:

(a) Systems that demonstrate numerically the post-development stormwater quality is equal to or better than the pre-development stormwater quality using methodology approved by the County Engineer or designee. Consideration shall be for both surface water and groundwater; or

(b) Dry retention systems that have a depth of four feet or less, measured from top of bank to pond bottom; or

(c) Dry retention systems that have a depth of six feet or less, measured from top of bank to pond bottom, with side slopes that are no steeper than 4:1 and sodded bottoms; or

(d) Wet retention/detention systems, including wetlands, that meet the governing State standards; or

(e) **Distributed volume.** This treatment type shall provide distributed volume within each sub-basin, mimicking the pre-development sub-basin, prior to discharging to the project's stormwater quantity facility.

1. The required volume to be distributed shall be a minimum of 75 percent of the difference between the post-development and the pre-development initial abstraction, not to exceed 1 inch. If the initial abstraction is less than 0.25 inches, a minimum of 0.25 inches shall be used. The initial abstraction shall be calculated using the National Resources Conservation Service Technical Release 55 (NRCS TR-55) methodology.

2. The contributing area shall be of approximately two acres or less.

3. Distributed volume shall be controlled within systems such as, shallow swales, bioretention facilities, or recessed medians located within a right-of-way, drainage right-of-way, drainage easement or conservation easement.

4. When bioretention facilities are used they shall provide retention/detention of stormwater for the basin utilizing vegetated depressions that implement landscaping and soil specifications in the design.

5. Distributed volume upstream of the receiving on-site retention/detention area shall fully recover surface storage within 72 hours.

6. There is no freeboard requirement for systems such as shallow swales, recessed medians or bioretention facilities used to solely achieve distributed volume.

7. Distributed volume shall be allowed within required buffer area if the applicant can demonstrate that the intent of the buffer can still be accomplished.

8. The seasonal high water table shall be a minimum of 1' below the invert of the swale or 1' below the bottom of the prepared soil matrix of the bioretention facility.

B. **Alternative treatment techniques.** When proposed systems do not meet the above stormwater quality criteria, two of the following alternative treatment techniques shall be implemented and evaluated per contributing basin.

(1) **Limiting direct discharge.** No greater than 15 percent of the project area can be directly discharged to the water quantity facility. Roof area shall not be included in these calculations and may be directly connected. The remaining impervious area shall be conveyed for a minimum distance of 25 feet at a rate no greater than 1.5 fps for a mean annual storm event to the water quantity facility via overland flow or a vegetated swale. Pipe can only be used when crossing under driveways and roads and when directly connecting roof runoff.

(2) **Pervious parking.** Projects that require more than 30 parking spaces shall utilize porous concrete or asphalt material on a minimum of 20 percent of the total parking spaces required. Approved grass parking spaces may also be used as an alternative to meet this requirement. Use of this alternative may be considered throughout the site and not per contributing basin.

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- (3) Stormwater harvesting system. This technique shall provide for the collection and reuse of stormwater or rainwater through the use of cisterns, underground tanks, wet stormwater facilities, rain barrels or other systems, as may be approved by the County Engineer or designee. These systems must harvest and reuse the first 1" of runoff from a minimum of 40% of the impervious area. Two alternative treatment techniques will be satisfied when runoff is collected from a minimum of 80% of the impervious area. Use of this alternative may be considered throughout the site and not per contributing basin. These systems must provide the following:
 - (a) An overflow or bypass.
 - (b) A drawdown mechanism by use or direct discharge.
 - (c) Reuse for irrigation or other approved purposes to augment a water supply.
 - (4) Site preservation. This treatment type shall provide for the preservation of natural low areas, existing vegetation, and wetlands as well as karst features, when only non-developed, natural areas discharge to the karst feature. A recorded conservation easement shall be established over the area to be preserved and shall not be less than 10 percent of the parcel of record at time of submittal. Marion-friendly landscaping area and groundwater recharge preservation area, when applicable, may be considered toward meeting this criteria.
 - (5) Limit impervious area. This treatment type shall limit the total impervious area to no greater than 50 percent of commercial or industrial parcels or 30 percent of residential subdivisions or 25 percent of residential parcels (when an individual residential improvement is being proposed without road improvements).
 - (6) Other low impact development treatment types. Alternative techniques may be approved by the County Engineer or designee in which the technique can demonstrate a water quality benefit greater than or equal to the treatment types provided in this division.
- C. Best Management Practices (BMPs) are characterized as runoff prevention, retention, detention, and pollution prevention. The following BMPs are required and shall be incorporated as part of the project's stormwater management system and demonstrated by a permit from another agency if applicable:
- (1) Oil/water separator or comparable BMP technology is required for pre-treating runoff from vehicular traffic areas associated with the following practices:
 - (a) Car washes;
 - (b) Auto or marine paint and body shops;
 - (c) Auto, recreational vehicle, commercial truck, tractor-trailer, farm tractor, heavy machinery, or small engine parts, service and repair operations;
 - (d) Automotive fleet operations; and
 - (e) Gas stations, including convenience stores with gas pumps.
 - (2) A minimum of three feet of unconsolidated soil material shall be provided between the surface of any limestone bedrock and the bottom and sides of any stormwater facility. Excavation and backfill of suitable material may be made to meet this criterion.
 - (3) Retention and/or detention facilities shall have a maximum depth of ten feet, as measured between the design high water elevation and the pond bottom for dry facilities, and between the design high water elevation and the normal control water elevation for wet ponds.
 - (4) Other best management practices are encouraged, such as but not limited to routine street sweeping, and fertilizer free zones. When practices such as these are proposed and documented in a manner that is enforceable, the County Engineer may accept these as an additional treatment technique.

Sec. 6.13.7 Geotechnical criteria.

- A. Methodology. The pattern and type of test borings shall be determined by the project engineer, geotechnical engineer, or geologist based on the project size, type, and complexity.

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- (1) Infiltration/permeability rate tests shall follow methods acceptable to the governing State agency and shall be performed at the depth and location which will provide representative test results for use in the design of the retention/detention area. Soil identifications shall refer to the AASHTO Soil Classification System conforming to AASHTO Designation M 145-91.
- (2) Where visual reconnaissance, available published data, and/or initial borings suggest high karst sensitivity or lithologic variability, additional borings may be required if deemed necessary by the County Engineer or designee.

B. Minimum requirements

- (1) Depth. Soil test borings shall be performed to a minimum depth of 10 feet below the proposed finished grade of the bottom of all retention/detention areas or the permanent pool elevation and once the data has been obtained the hole shall be backfilled and compacted.
- (2) Number of tests. **At least two tests shall be performed** within the boundary of each proposed retention/detention area. For each half acre of pond bottom area and for each lineal retention/detention area of 250 feet, an additional test shall be conducted. The County Engineer or designee, may require additional tests if the initial tests indicate the need for them.
- (3) Infiltration/permeability tests. For retention/detention areas utilizing percolation or infiltration in the design model, there shall **be a minimum of two infiltration rate tests** for each retention/detention area. Data used for soil permeability testing or infiltration analyses for the retention/detention areas shall be signed and sealed by a professional engineer or professional geologist for both data and procedural accuracy.
- (4) Aquifer parameters. The estimated seasonal high ground water elevation and confining layer shall be clearly identified.

C. Design considerations

- (1) The estimated seasonal high water elevation and the confining layer shall be set no lower than the bottom of the boring for the purposes of stormwater system modeling.
- (2) The pond bottom elevation of a stormwater facility shall be designed a minimum of 1' above the estimated seasonal high water elevation. When the pond bottom is within 1' of the estimated seasonal high water elevation, a 50 percent reduction factor shall be used for percolation or ground water mounding analysis shall be included.

Sec. 6.13.8 Stormwater conveyance criteria.

- A. Methodology. Calculations for stormwater collection and transmission systems shall be designed using the Rational Method based on FDOT Zone 7 Intensity - Duration Curves. Ditch and storm drain flow capacity shall be determined from Manning's Formula with coefficients of roughness based on an assumption of conditions of ultimate development.
- B. Minimum requirements
 - (1) Design storm. Conveyance systems shall be sized to accommodate the 25-year 24-hour storm event based on the condition of ultimate development.
 - (2) Tailwater**
 - (a) The tailwater elevation utilized shall be based on the tailwater elevation of the receiving water body plus 6" at the peak discharge time of the design storm.
 - (b) Alternatively, the tailwater elevation utilized can be the design high water elevation of the 25-year 24-hour design storm.
 - (c) Note that future connections must be able to demonstrate that conveyance can be achieved at all connections, future and existing, meeting one of the above criteria.
 - (3) **Lane spread.** Lane spread shall be calculated using FDOT criteria considering the 4 inch per hour or 10-year frequency storm as appropriate, to produce the following results:

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- (a) Subdivision Local and Minor Local Roads. The allowable lane spread shall be no greater than the crown (or high side) of the road. For all divided roadways the allowable lane spread shall be no greater than the inside (or high side) edge of pavement.
 - (b) Arterial, Collector, and Major Local Roads. The allowable lane spread shall leave 8' of travel lane dry in each direction.
 - (4) Drainage rights-of-way. All retention/detention areas within subdivision developments shall have direct access to a right-of-way. A drainage right-of-way may be necessary to establish this access. A minimum 12' wide, stabilized vehicle access at six percent maximum grade shall be provided to allow for ingress and egress of the retention/detention area. Drainage rights-of-way shall be a minimum of 30 feet in width. As an alternative to right-of-way, access may be provided by an easement of the same width.
 - (5) Drainage easements. All drainage swales to facilities or underground stormwater conveyance systems shall be within drainage easements, except where rights-of-way are provided. Drainage easements shall be a minimum of 20 feet in width.
 - (6) Floodways. If in a floodway or flood prone area, the cross drain shall be sized to accommodate the design intent of that basin.
 - (7) Sizes. Stormwater conveyance pipes and cross culverts shall be a minimum of 18" diameter or equivalent. Driveway culverts shall be a minimum of 15" diameter or equivalent for residential use and a minimum of 18" diameter or equivalent for commercial use. Roof drains, prior to connection to the overall stormwater system, are exempt from minimum diameter requirements.
- C. Design considerations
- (1) Culvert flow capacity shall be determined for the conditions of inlet control or outlet control as applicable.
 - (2) Stormwater collection and transmission systems shall be by inlets, swales, culverts, etc. The use of siphons, pumps, or similar devices is not allowed.
 - (3) Ditch blocks shall be designed and constructed with hard core centers.
 - (4) Stormwater flow velocity shall be taken into consideration in the design of all drainage ditches and appropriate erosion protection shall be provided in accordance with the FDOT Drainage Manual.
 - (5) Where any storm pipe terminates at an earthen slope a mitered end section and concrete collar, or approved equal, is required. Concrete mitered end sections are required for culverts, cross drains and side drains when within a County right-of-way with posted speeds of 40 mph or greater.

Sec. 6.13.9 Grading criteria.

- A. Parcels and lots. Sufficient grading shall be designed to allow surface water runoff and controlled discharge be drained to the retention/detention areas without causing adverse affects on adjacent property. Each parcel or lot shall have a direct connection to the stormwater system, unless the applicant can clearly demonstrate that there are not adverse impacts to adjacent property. In subdivisions, each lot shall have grading designed to be independent of any other lot unless provisions are made for multi-lot grading at initial phase of development, and/or easements for grading purposes are established. All downstream grading must be at a level of completion to support upstream development prior to or simultaneously with the upstream development. Grading can be demonstrated by the use of flow arrows, spot grades, and other iteration callouts, details, and typical grading depictions, or any combination thereof.
- B. Buildings. All buildings shall have a minimum finished floor elevation 8" above finish grade and graded away from the building for stormwater runoff. Exception: porches, patios, carports, garages, screen rooms may be 4" above finish grade. In no case shall finished floor elevations be specified below the one percent (100-year) flood plain plus one foot.
- C. Driveways. In the case where roadside swales are the drainage conveyance system, driveway design information shall be included on the plans minimally addressing culvert size, invert elevation, and direction of slope of culvert or the placement of ditch block for each at every specific lot. If design is not to be lot-specific, design shall be based on worst-case scenario.

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- D. Affidavit. At time of building application, applicant shall provide an affidavit that the impervious area, lot grading plan, minimum finished floor elevation, and stormwater system complies with the development plan on file with the County. If no development plan is on file, applicant shall provide an affidavit that all drainage is held on-site or directly tied to a recognized drainage system. The applicant shall provide a sketch with the building application indicating the drainage intent.
- E. Construction. All stormwater runoff increase during construction and following must be kept on-site or directed to swales, ditches, or piping to approved drainage areas.

Sec. 6.13.10 Erosion control.

- A. Erosion and perimeter controls shall be used to prevent runoff, and/or disposition of sediment from the site and shall be regularly inspected and maintained during construction. Sites are required to control waste such as building materials, concrete truck washouts, chemicals, litter, and sanitary waste. Failure to install or maintain erosion, perimeter, and waste controls shall result in enforcement, up to and including an order to stop all work until site is in compliance.
- B. Compliance with the FDEP's National Pollution Discharge Elimination System (NPDES) shall be demonstrated by providing a copy of the permit or notice of intent prior to construction.

Sec. 6.13.11 Illicit connection and illicit discharge.

- A. Prohibitions. Throwing, draining, or otherwise discharging, causing, or permitting others to throw, drain, or otherwise discharge into public right-of-way, easement, or any County permitted stormwater system, any liquids, solids or waters containing any wastewater, pollutants, contaminants or hazardous materials other than stormwater is prohibited.
- B. Exceptions. The following are exceptions to the above discharge prohibitions:
 - (1) Discharges and releases from the following sources: potable water line flushing, irrigation, diverted stream flows, rising ground waters, uncontaminated ground water infiltration, uncontaminated pumped ground water, discharges from potable water sources, building foundation drains, air conditioning condensation, natural springs, water from crawl space pumps, roof drains, footing drains, individual residential car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, street maintenance wash-down water;
 - (2) Discharges or water flow from firefighting operations;
 - (3) Other discharges expressly specified in writing by the County Engineer as being necessary to protect public health and safety;
 - (4) Discharges associated with investigatory dye-testing. However, this activity requires prior written notification to the Office of the County Engineer 24-hours prior to the time of the dye test;
 - (5) Non-stormwater permitted discharges under an NPDES permit, waiver, or waste discharge order issued to the discharger and administered under the authority of the United States Environmental Protection Agency (EPA), provided that the discharger is in full compliance with all requirements of the permit, waiver, or order and other applicable laws and regulations, and provided that written approval has been granted for any discharge to the stormwater management system; and
 - (6) Charity car washes.

Sec. 6.13.12 Operation and maintenance.

- A. The stormwater management system and associated elements shall be operated and maintained in accordance with this Code, the applicable water management district, the manufacturer's specifications, and other specifications necessitated by the design.
- B. An operation and maintenance document shall be provided. The owner shall include a signed and dated certification in the document as follows: I hereby certify that I, my successors, and assigns shall perpetually operate and maintain the stormwater management and associated elements in accordance with the

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specifications shown herein and on the approved plan (this signature is not required until the final submittal).

- C. Operation and maintenance documentation shall be incorporated into any contracts, covenants, and/or restrictions for the property owner association and/or property management association.

Division 14 Water and Wastewater Requirements

Sec. 6.14.1 Purpose and Intent.

This section sets forth the general requirements for the uniform design and approval of utility systems.

Sec. 6.14.2 Connection Requirements.

A. Connection determination

- (1) All new and expanding development projects shall contact the MCUD for determination of availability and/or point of connection. Within ten working days, the MCUD shall issue an official written determination advising the applicant if services are available and, if so, shall indicate the potential source, the nearest connection point, and the need for any additional off-site facilities. Potential sources may include MCUD, a PSC-certified utility, a city, a Community Development District, or other entity authorized by the State of Florida to provide water and wastewater services. The written determination shall accompany all applications for building permits and/or other development reviews.
- (2) Connection distance determinations shall be measured beginning at the nearest property boundary and extend along any legal access eligible for utility installation and/or operation using the shortest distance measurement.

B. New Single Family Residential and Duplex Construction

(1) Water system

- (a) New single family residential in the Urban or Rural area shall connect to a centralized water system with available capacity if a water line is within a connection distance of 200'.
- (b) New duplex construction in the Urban or Rural area shall connect to a centralized water system with available capacity if a water line is within a connection distance of 400'.

(2) Wastewater system

(a) Single Family Residential

- 1. New single family residential in the Urban or Rural area shall connect to a central sewer system if a sewer line from a central sewer system with available capacity is within a connection distance of 200' and connection may be made to the existing sewer line using a gravity line or an on-site pumping station; or
- 2. New single family residential in the Urban or Rural area shall connect to a central sewer system if a sewer line from a decentralized sewer system with available capacity is within a connection distance of 200' and permission is obtained by the owner/operators of the decentralized system.

(b) Duplex Construction

- 1. New duplex construction in the Urban or Rural area shall connect to a central sewer system if a sewer line from a central sewer system with available capacity is within a connection distance of 400' and connection may be made to the existing sewer line using a gravity line or an on-site pumping station; or
- 2. New duplex construction in the Urban or Rural area shall connect to a central sewer system if a sewer line from a decentralized sewer system with available capacity is within a connection distance of 400' and permission is obtained by the owner/operators of the decentralized system.

C. New Development in Urban Areas

(1) Water System

All new developments shall connect to an existing central water system if a system with available capacity

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has distribution lines within a distance equal to or less than 400' times the total number of ERCs within the project at build out. Otherwise, the project shall comply as follows:

- (a) New residential development with 31 lots or more, all multi-family and commercial projects, shall design and construct a decentralized water system in compliance with the requirements of **Section 6.14**, and construct an onsite WTP sufficient in size to serve the development in compliance with FDEP requirements and other applicable requirements of this Code.
- (b) New residential developments with less than 31 lots and more than one mile from the nearest existing central water system may use individual onsite wells in compliance with the requirements of FDOH.

(2) Wastewater system

All new development shall connect to an existing central sewer system if a system with available capacity has a treatment plant or sewer line within a connection distance of 400' times the total number of ERCs within the project at build out. Otherwise, the project shall comply with the following as applicable:

- (a) New residential developments with five or more ERCs shall be serviced by a decentralized wastewater treatment system.
- (b) New residential developments that consist of fewer than five ERCs may use individual OSTDS in conformance with **Section 6.13.3**, or
- (c) New non-residential site developments with no food preparation that consist of 15 or more ERCs and will discharge only domestic waste, shall design and construct a wastewater treatment system that complies with all applicable requirements of the FDEP, or
- (d) New non-residential site developments with no food preparation that consist of fewer than 15 ERCs and will discharge only domestic waste may use an OSTDS with a minimum effective septic tank capacity of two times the requirements of the FDOH and an approved outlet filter is installed.
- (e) New non-residential site developments which include cooking or food preparation on site may discharge into the systems referenced in **subsections (a) and (b)**, above, providing the food preparation wastewater is pretreated and monitored as follows:
 - 1. The facility shall install grease removal systems, providing an effective size of 1.5 times the requirement of FDOH, or 1,200 gallons, whichever is greater.
 - 2. Grease removal systems and traps shall comply with the MCUD Industrial Pretreatment Ordinance, as amended.
 - 3. For OSTDS users, failure to submit an annual maintenance report to MCHD, or the utility provider shall constitute a violation of this LDC.
 - 4. Grease removal systems shall comply with design standards in FAC64E-6.

D. New Development in Rural Areas

(1) Water system

New rural developments with any buildable lot less than two acres in size shall connect to an existing central water system if a system with available capacity has water distribution lines within a connection distance of 400' per each ERC from the project boundary. Otherwise, the developer shall design and construct a decentralized water system in compliance with all applicable FDEP requirements and construct an onsite WTP that meets the needs of the development and complies with all applicable requirements of the FDEP. The project may use individual onsite wells if:

- (a) The project contains 31 units or less with a gross density no greater than one unit per 3.5 acres and a minimum lot size of one acre; or
- (b) All lots contain a minimum buildable area of two acres.

(2) Wastewater system

New rural developments containing any buildable lot less than five acres in size shall connect to an existing central sewer system if a system with available capacity has a treatment plant or sewer line within

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a distance of 400' times the total number of project ERCs at build out or five miles, whichever is less. Alternatives to this requirement are as follows:

- (a) If all lots are at least one acre in size, the developer shall design and construct a decentralized wastewater treatment system that meets the needs of the development and complies with all applicable requirements of FDEP or FDOH, as applicable, and the County.
- (b) If the project at build out contains less than five lots and all lots are at least one acre in size, then the development may utilize OSTDS that meets the requirements of FDOH and **Section 6.13.3**.
- (c) If all buildable lots at build out are five acres or greater, the development may utilize an OSTDS that meets the requirements of FDOH and **Section 6.13.3**.

E. Reclaimed Water System

- (1) All new projects which consist of 31 or more ERCs and are required under **Section 6.13.2 A-D** above to connect to a central sewer system shall contact MCUD for availability of reclaimed water.
- (2) The project shall connect to the County's reclaimed water system if MCUD determines that incorporation into the system represents a beneficial use of the reclaimed water. If so required, the installation of an appropriate reuse distribution system, and connection to the reclaimed water system shall be a condition precedent to receipt of potable water and wastewater service.

Sec. 6.14.3 Onsite Waste Treatment and Disposal Systems (OSTDS).

The following will apply to new, modified, or repaired OSTDS:

- A. All OSTDS permits shall be issued in conjunction with a notification of mandatory connection to a central sewer system, in accordance with **Section 6.13.2**.
- B. Nothing set forth herein shall preclude the Board or DRC from requiring PBTS on a case-by-case basis and considering soil conditions, parcel sizes and the proximity to protected springs.
- C. Any OSTDS that is determined to be failing shall be required to be brought into compliance with current DOH standards within 90 days of the inspection date, or sooner if the failing conditions pose an imminent threat to public health and safety, as determined by the MCHD, or the Board.
- D. For any activity related to OSTDS that requires a Repair/Modification Permit from MCHD on or after January 1, 2011, a minimum of 24" separation between the bottom of the drainfield and estimated wettest season water table shall also be required.
- E. Repairs or modification of drainfield components must comply with current FAC regulations for new systems regarding size and construction.

Sec. 6.14.4 Capital Charges and Flow Rates.

- A. One ERC shall have an assigned value of 1.00.
- B. One ERC shall be equal to a flow of 350 gpd for water, and 300 gpd for wastewater.
- C. A single family residence shall have an ERC value of 1.00. Each multifamily or RV unit shall have an ERC value of 0.80.
- D. Non-residential units shall be calculated based on the current Florida Building Code fixture unit flow value as approved by MCUD.
- E. Total capital charges shall be based on ERC units multiplied by the current connection charges as set forth in Ordinance 08-27, as amended.

Sec. 6.14.5 Submittal Requirements.

- A. Plan Sheets
 - (1) The entire utility system shall be shown on the utility plan, including the existing water systems and all proposed components within the project area.
 - (2) All on-site and off-site mains proposed by developer shall be drawn in plan and profile. At a minimum, the

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plan and profile drawings shall include the following information:

- (a) Profile with elevations at one foot interval, or more frequently if required by good design practice;
 - (b) Horizontal and vertical control in accordance with **Section 6.5.6** of this Code;
 - (c) All conflicts with other utility and drainage systems;
 - (d) Pipe data including size, lengths, material, and slopes;
 - (e) Size and type of fittings, valves, hydrants, air release/vacuum relief, and other related appurtenances;
 - (f) Note stating construction shall not exceed limits of pipe deflection per manufacturer's specifications;
- (3) Separate plan sheet(s) showing location(s) and general layout of wastewater pump stations with details, working elevations, and schedules;
 - (4) Description and limits of special bedding requirements;
 - (5) Pipe restraint requirements;
 - (6) All manhole locations, rim and invert elevations for manholes outside of paved areas;
 - (7) Description and limits of special exterior coatings;
 - (8) Details of connection to existing systems; and
- B. Construction notes regarding cover, horizontal and vertical control datums, special construction requirements, and references to standard and special details.
 - C. Copies of all related permit applications and issued permits shall be submitted to MCUD.
 - D. Hydraulic analysis
 - (1) Hydraulic analysis shall include all input parameters, supporting calculations, assumptions, documentation for design and results. The project engineer shall submit signed, sealed, and dated design calculations with the plans for all projects.
 - (2) Hydraulic calculations shall show that the distribution system, collection system or treatment facilities mains will have sufficient hydraulic capacity to provide and transport peak hourly flows and the combination of maximum daily flows and fire flows. Head losses through meters and backflow devices shall also be included in calculations for all multi-family, commercial, industrial projects, and residential meters and backflow devices 2" and larger.

Sec. 6.14.6 Design Criteria.

- A. All utility systems shall be designed for the estimated tributary population.
- B. All utility systems shall be designed utilizing components with a minimum 30 year life span.
- C. Systems intended to be owned and maintained by MCUD shall be designed for the tributary population and in conformance with the adopted Marion County Utilities Master Plan, as amended.
- D. Water systems shall be designed to satisfy the domestic water demand and fire protection requirements.
- E. All systems to be owned, operated, or maintained by MCUD shall be subject to a pre-design meeting with the MCUD.
- F. All meters less than 4" in size shall be installed underground in an approved meter box. Meters 4" and larger may, at the discretion of MCUD, be installed above ground. Meters larger than 4" shall be located in a meter easement located adjacent to the public right-of-way.
- G. All meters in a MCUD maintained system shall be installed and inspected by the MCUD after receiving payment of applicable fees and charges.
- H. All pipe shall comply with FDEP color standards.
- I. The engineer shall provide the required lengths of restrained joint ductile iron pipe in table form on the plans.

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Sec. 6.14.7 Construction Inspection.

- A. Utility installation projects shall be inspected on an as needed basis by MCUD to determine conformance to the approved plans and specifications.
- B. Non-conformance with approved plans or specifications, or evidence of faulty materials or workmanship shall be called to the attention of the developer or engineer. If deficiencies are not corrected in an expeditious manner, MCUD shall suspend all work on the project or withhold the Certificate of Completion.
- C. A final inspection with MCUD is required prior to final approval for completion.

Sec. 6.14.8 Completion and Closeout.

- A. As-Built/Record Survey requirements shall be provided for those systems that are owned, operated, or connected to MCUD and shall meet criteria identified in **Section 6.5.7**.
 - (1) Three sets of As-Built/Record Survey signed and sealed by a Florida Licensed Professional Surveyor and Mapper shall be submitted to MCUD prior to final inspection along with a digital version of the survey and plan set in a format pre-approved by MCUD.
 - (2) Inspection and testing reports of all improvements shall be submitted with the As-Built/Record Survey.
 - (3) Certification of Final Completion: When all required improvements have been constructed, the engineer shall submit a request for final inspection with a certification of final completion. The certification language is available at MCUD. After all work is completed, inspected, and accepted by the County, an approval letter will be issued to the applicant.
- B. A maintenance agreement with a security limited to an irrevocable letter of credit or bond only in the amount of ten percent of the original construction costs of all constructed and accepted utility systems to be owned and maintained by the County. Such bond or letter of credit shall guarantee maintenance of the constructed and accepted utility systems for a minimum of one year from the date of construction completion, acknowledged by MCUD and shall be released upon acceptance of the constructed systems for maintenance by Marion County.

Sec. 6.14.9 Transfer of facilities to Marion County Utilities.

- A. Prior to plan approval, an executed utility developer's agreement is required. This agreement shall run with the land and be binding on the developer, its successors, assigns and any other subsequent owner of the land, setting forth such reasonable provisions governing developer and MCUD responsibility pertaining to:
 - (1) The installation of service facilities;
 - (2) Private plumbing lines with the facilities of MCUD;
 - (3) The manner and method of payment of contributions, fees and charges;
 - (4) Guaranteed revenue provisions;
 - (5) Standards of construction or specifications;
 - (6) Regulations, policies, practices and procedures of MCUD;
 - (7) Prohibitions against improper use of MCUD's facilities;
 - (8) Entity responsible for ownership and operation of facilities; and
 - (9) Other matters normally associated with and contained in the utility developer's agreements.
- B. All facilities constructed on the developer's property prior to interconnection with MCUD's existing or proposed facilities shall convey such component parts to MCUD by bill of sale in a form satisfactory to the County Attorney, with the following evidence required by MCUD:
 - (1) Facilities proposed to be transferred to MCUD are free of all liens and encumbrances;
 - (2) MCUD has approved the construction of such facilities and accepted the tests to determine that such construction is in accordance with the criteria established by the MCUD;
 - (3) The Board has evidenced its acceptance of such facilities for MCUD's ownership, operation, and

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maintenance; and

- (4) The developer shall maintain accurate cost records establishing the construction costs of all utility facilities constructed and proposed to be transferred. Such cost information shall be furnished with the bill of sale and shall be a prerequisite for acceptance.
- C. MCUD may refuse connection and deny service until such time as all transfer requirements have been satisfied by the developer or the developer's successors or assigns.

Division 15 Water System

Sec. 6.15.1 Purpose and Intent.

This section sets forth the general requirements for the design of a potable water distribution system.

Sec. 6.15.2 Decentralized Systems.

- A. The decentralized water distribution system shall be constructed within public rights-of-way or utility easements and in compliance with this section and **Article 7**.
- B. The decentralized WTP shall be designed in compliance with the requirements of FDEP and shall be constructed on a dedicated utility site, which will be preserved and protected for the WTP, including protection area surrounding all well sites, until connection to a centralized system is available.
- C. If the decentralized water system is owned, operated or maintained by an entity that has a PSC franchise, such entity must, as a condition of such ownership or operation, agree to terminate or modify the franchise in compliance with the requirements of Section D, below.
- D. A decentralized WTP which applied for a permit from Marion County after August 1, 2009, as per Ordinance 09-17, shall be taken out of service, deeded, or reclassified under any of the following conditions, which may be appealed to the DRC:
 - (1) A centralized system meeting the requirements stated in subsections B and C above, as determined by the owner of such centralized system, is available, at which time the centralized system owner will be responsible for providing the surveying, design, permitting, and construction of all components necessary to connect the decentralized water system to the centralized system. After connection, all components of the water system will be owned, operated, and maintained by the centralized system owner who will also be responsible for the installation and operation of all water metering; or
 - (2) The MCUD Director and a centralized system owner has determined the WTP is suitable for expansion or inclusion into the centralized system owners PSC territory, the WTP property and all improvements shall be deeded to the centralized system owner and reclassified as a centralized system; or
 - (3) If the MCUD Director determines that the size, location, or other factors show the decentralized system is not feasible for connection or inclusion into a franchised territory, the system will be reclassified as a centralized system. The reclassified system must be operated and maintained by an FDEP approved service company.
- E. A decentralized water facility as described in **Section 6.14.2 above**, shall not be transferred to a centralized system owner without the project's decentralized wastewater system, if applicable, also being transferred to the centralized system owner. As a condition of the transfer of a project's decentralized water system, the transferee must also accept transfer of the project's decentralized wastewater system.

Sec. 6.15.3 Fire Protection.

Fire Flow capacity for water distribution systems and/or water main extensions shall be designed and constructed in accordance with **Division 19**.

Sec. 6.15.4 Water Distribution System.

- A. Piping
 - (1) Water mains shall maintain a consistent alignment with respect to the centerline of the road, when

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installed in rights-of-way.

- (2) Water mains located outside of dedicated rights-of-way shall require a minimum 20' easement.
- (3) Water mains located adjacent to a road right-of-way shall have a minimum 10' easement. Additional easement widths shall be provided, as needed.
- (4) Water mains shall not be placed under or within ten feet of the high water line of retention ponds, retention pond berms or any vertical structures.
- (5) Water mains shall not be located along side or rear lot lines, except when placed in a dedicated easement.
- (6) No water pipe shall pass through or come in contact with any part of a sanitary sewer manhole.
- (7) Separation of water mains shall be in accordance with **62-604.400(2)(g),(h),(i) and (3), FAC**.
- (8) Requirements for Loop Mains
 - (a) A 6" looped connection shall be required in cul-de-sac areas and low density residential projects, unless a smaller looped connection is authorized by MCUD.
 - (b) Where looping of mains is not practical, minimum 8" mains shall be required, unless detailed calculations are submitted to substantiate the sufficiency of a 6" main.
 - (c) In commercial, industrial, and high density residential areas, minimum 8" looped mains shall be required. Larger size mains shall be required if necessary to allow the withdrawal of the required fire flow while maintaining the minimum residual pressure specified in **Section 6.14.1.F.(3)(a)**.
- (9) Location and identification of all water mains and valves shall comply with **Section 7.5.12**.

B. Pressure

- (1) The distribution system shall be designed to maintain a minimum pressure of 20 psi during conditions of maximum daily load plus fire flow.
- (2) The pressure in the distribution system shall be approximately 55 psi. In no case shall pressure be lower than 35 psi downstream of a backflow prevention device.
- (3) For high pressure systems, special design considerations are required.

C. Dead Ends

- (1) Dead end mains shall be minimized by making appropriate tie-ins as determined by MCUD.
- (2) Where dead-end mains occur, a fire hydrant, an approved flushing hydrant, or a blow-off valve shall be provided.

D. Flushing

- (1) Flushing devices shall be sized to provide a velocity of at least 2.5 FPS in the water main being flushed.
- (2) No flushing device shall be directly connected to any sewer.

E. Valves

- (1) Valves shall be located at not more than 500' intervals in commercial, industrial and high density residential areas and at not more than 1,000' intervals in all other areas. The MCUD Director, or designee, may approve alternative valve spacing.
- (2) Appropriate valving shall also be provided at all water main intersections to ensure effective isolation of water lines for repair, maintenance, or future extension.
- (3) Hydrants or automatic air relief valves shall be provided at high points in water mains to remove accumulated air. Automatic air relief valves or hydrants shall not be used where flooding of the manhole or chamber may occur.

F. Drainage chambers, pits or manholes containing valves, blow-offs, air relief valves, meters, or other such appurtenances shall not be connected directly to any storm drain or sanitary sewer.

G. Disinfection of any part of MCUD water distribution system which has direct contact with finished water and has been out of service for repair, alteration, or replacement shall be as outlined in **Section 7.5** and as

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specified by DOH.

Sec. 6.15.5 Water Services and Connections.

- A. No service or connection to a Marion County system shall be made until payment of applicable fees and charges is received by MCUD.
- B. Water services and connections shall conform to the applicable provisions of the code. Where water services greater than 12" are required, dual services shall be provided.
- C. Water services and connections to existing County systems up to 4" are available from MCUD. Services and connections to new water systems, and to existing systems that are 6" and larger, shall be made by the contractor.

Sec. 6.15.6 Water Metering.

- A. All water service connections to centralized and decentralized systems shall be metered. The method of metering will follow the guidelines listed below. The engineer must obtain approval from MCUD before finalizing the design of the metering system.
 - (1) Single family and duplex residential units and subdivision lots with public or private rights-of-way or easements shall be individually metered. Single services shall be installed at property lines; double services shall be installed at property corners. Service placements shall not disturb survey monuments, if present.
 - (2) Commercial, industrial, and institutional projects shall be individually metered. Each unit within a structure shall be individually metered.
 - (3) Multi-family, apartments, and condominium projects shall meter each unit.
- B. Meters shall be located in the public rights-of-way, or as approved by MCUD.
- C. Size of all meters shall be determined in accordance with current AWWA Standards.

Sec. 6.15.7 Cross Connection Control and Backflow Prevention.

- A. General
 - (1) All rules, regulations, and procedures embodied herein shall be consistent with the Recommended Practice for Backflow Prevention and Cross-Connection Control, American Water Works Association Manual 14, as amended, and Florida Building Code as adopted by Marion County. Except as otherwise indicated, backflow protection at service connections shall be at least as stringent as recommended in the American Water Works Association Manual 14.
 - (2) All reduced pressure principle assemblies and double check valve assemblies shall be tested annually.
 - (3) All dual check devices shall be overhauled and/or replaced at least every five years at the customer's expense.
 - (4) All costs of installation, maintenance, and testing of backflow prevention devices shall be the responsibility of the customer.
 - (5) Any backflow prevention assembly required herein shall be a model and size approved by MCUD.
 - (6) If any conflict should exist between a provision of the manual and the provisions of this ordinance, the LDC, the Florida Building Code as adopted by Marion County, the Florida Safe Drinking Water Act, or any other State or County statute, ordinance, rule, or regulation applicable to public water systems, the more restrictive provision shall apply.
- B. Applicability. All water service connections to MCUD shall comply with the provisions of this code.
- C. Residential backflow prevention requirements.

A backflow preventer shall not be required at service connections to residential premises where the plumbing system complies with current Florida Building Code requirements, and there is no auxiliary or reclaimed water system, no fire protection system, no irrigation system, no solar hot water system, and/or no swimming pool, unless determined necessary by MCUD.

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- D. Residential auxiliary or reclaimed water system.
- (1) Auxiliary water systems supplied with water from a private well; or reclaimed water systems supplied with reclaimed water from a 'closed' reclaimed water system, shall install one of the four backflow prevention options below:
 - (a) Reduced pressure principle assembly (tested annually);
 - (b) Reduced pressure vacuum assembly (tested annually);
 - (c) Double check valve assembly (tested annually); or
 - (d) Dual check device plus any one of the following measures:
 1. well water testing;
 2. premises inspections;
 3. automated meter reading;
 4. customer agreements; or
 5. managed properties.
 - (2) Residential surface auxiliary water system or open reclaimed water system.
 - (a) Auxiliary water systems supplied with surface water; or reclaimed water systems supplied with reclaimed water from an open reclaimed water system, shall install one of the three options below:
 1. Reduced pressure principle assembly;
 2. Double check valve assembly plus any one of the following measures:
 - a. premises inspections;
 - b. automated meter reading;
 - c. customer agreements; or
 - d. managed properties.
 3. Dual check device plus any two of the measures from **6.14.7.D.d.2 through 6.14.7.D.d.5 above**.
 - (3) Well water testing:
 - (a) MCUD shall require the customer to provide a DOH approved laboratory, water quality test on the well water.
 - (b) The water quality test shall analyze for e-coli annually and shall analyze for nitrate/nitrite every five years.
 - (c) The customer shall utilize another dual check sub-option from **6.14.7.D.d.2 through 6.14.7.D.d.5** or install a reduced pressure principle assembly or a double check valve assembly, if water quality tests are positive for e-coli, or exceed the maximum contaminant level for either nitrate or nitrite.
 - (4) Premises inspections:
 - (a) MCUD shall maintain an agreement with the customer that allows for periodic inspections of the premises and ensure that they inspect premises for cross-connections on a periodic basis not to exceed every five years. MCUD standard deposit receipt and service agreement meet this requirement.
 - (b) MCUD shall have an inspection protocol and an inspection form to be signed by the inspector and shall make completed and signed inspection forms available for review by the FDEP, DOH, the customer, and the public upon request.
 - (5) Automated Meter Reading (AMR):

If the system has installed AMR, or will do so within five years for existing premises, and uses AMR for all new premises, such AMR shall have the ability to detect backflow through the meter and either provide immediate notification of the backflow event or record the backflow data for transmittal or retrieval on at least a monthly basis.

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(6) Customer agreements:

- (a) MCUD and the customer shall sign an agreement that prohibits the customer from cross-connecting the customer's auxiliary or reclaimed water system to the customer's potable water system.
- (b) The agreement shall stipulate penalties for discovered cross-connections. Penalties may include, but are not limited to, monetary fines, discontinuation of service, and/or a requirement for installation of a more protective back flow preventer.

(7) Managed Properties:

The third party's legal instrument establishing the restrictions shall be reviewed and kept on file by MCUD.

E. Fire Protection Systems.

- (1) A reduced pressure principle assembly shall be required when a fire protection system is also connected to an auxiliary water supply or source or has provisions for introducing chemical additives or antifreeze into the system.
- (2) A reduced pressure principle assembly or a double check valve assembly shall be required when a new closed (i.e. non-flow through) wet pipe sprinkler system, or new closed wet stand pipe system has no connections to auxiliary water supplies or sources and has no provisions for adding chemical additives or antifreeze.
- (3) A reduced pressure principle assembly or double check valve assembly shall be required for an existing closed (i.e. non-flow through) wet pipe sprinkler system, or existing closed wet stand pipe system, that has no connection to an auxiliary water supply or source, and has no provisions for introducing chemical additives or antifreeze into the system.
- (4) No backflow prevention device shall be required if the sprinkler or stand pipe system is provided with a lead free alarm check valve.
- (5) Temporary connection to fire hydrants shall be metered and have a dual check valve assembly.

F. Irrigation Systems.

- (1) A reduced pressure principle assembly shall be required if the irrigation system is connecting to an auxiliary water supply or source or has provisions for introducing chemicals into the system.
- (2) A reduced pressure principle assembly or a pressure vacuum breaker assembly shall be required for irrigation systems that have no connections to an auxiliary water supply or source, and have no provisions for introducing chemicals into the system.

G. Solar Hot Water Systems.

- (1) If the solar hot water system is equipped with double wall heat exchanger and leak detection, no additional backflow prevention devices are required.
- (2) A reduced pressure principle assembly shall be required for all solar hot water systems not having double walled heat exchangers and leak detection.

H. Multi-story Buildings. All buildings with three or more floors shall install a reduced pressure principle assembly.

I. Commercial Backflow Prevention Program Requirements.

- (1) All commercial and industrial customers connected to MCUD shall install backflow prevention devices according to the AWWA Manual 14, as amended.
- (2) Developers are required to coordinate selection of the device with MCUD.

J. Evaluation Assessment.

- (1) The construction plans shall be reviewed to ensure that backflow prevention has been appropriately addressed in accordance with Florida Building Code, Plumbing Sections 601 through 613.

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- (2) All new service connections shall be assessed before providing water service to the service connections.
 - (3) Existing service connections shall be assessed whenever there is a change in the customer of record.
 - (4) All existing service connections shall be assessed at least once prior to December 31, 2016.
 - (5) Non-community water systems that are reclassified as a public potable water system on or after the effective date of this code shall assess all existing service connections at least once within two years after the non-community water system is reclassified as a public potable water system or by December 31, 2016.
 - (6) Assessments may be made by use of a questionnaire or inspection as appropriate.
- K. Cross-Connection Control Program Recordkeeping.
- (1) MCUD shall keep records of service connection assessments as follows:
 - (a) A record of the latest assessment questionnaire or inspection report for each service connection indefinitely;
 - (b) Actual questionnaires or inspection reports may be kept or information may be transferred to tabular summaries.
 - (2) MCUD shall keep an up-to-date inventory of all backflow preventers installed at service connections and at locations where fire protection systems, irrigation systems, and solar hot water systems are connected internally to the customer's potable water system.
 - (3) For each such backflow preventer, the inventory shall include:
 - (a) The location of each backflow prevention device;
 - (b) A description of the hazard being contained or isolated by the device;
 - (c) The type of backflow prevention device;
 - (d) The installation date and date of last repair; and
 - (e) The records of backflow prevention device testing for at least five years with the following information:
 1. Identification of the backflow prevention device;
 2. The name of the tester; and
 3. The test results.
 - (4) Actual test reports may be kept, or information may be transferred to tabular summaries.
 - (5) MCUD shall keep annual cross-connection control program activity reports and backflow incident reports for at least 10 years as required by **FAC 62-555**.
- L. Public Education Procedures.
- (1) MCUD shall include a brief description of their cross-connection control program in their annual consumer confidence reports, as required by **FAC 62-550.824**.
 - (2) Educational brochures shall be provided to all existing customers prior to December 31, 2016 and to all future applicants for water service.
- M. Incident Response and Investigation Procedures.
- (1) MCUD shall report by telephone and speak directly to a person at the appropriate FDEP District Drinking Water Office or to MCHD as soon as possible, but no later than noon of the next business day after discovery of a backflow incident or prohibited connection.
 - (2) Within one month after discovery of a backflow incident, public potable water system operators shall prepare and submit to the appropriate FDEP district office or MCHD, a written backflow incident report that includes the following information:
 - (a) The date and approximate time of discovery of the backflow incident;
 - (b) The source and cause, or suspected source and cause of the backflow incident;
 - (c) The type and concentration of contaminants or foreign substances found within the public water distribution system or the customer's potable water system as a result of the backflow incident and the

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portion of the public water distribution system affected by the incident;

- (d) The precautionary and corrective actions taken in response to the backflow incident and the date and approximate time of completion of each action; and
- (e) The number and type of illnesses or physical health problems reportedly resulting from the backflow incident, to the extent known by the public potable water system.

N. Prohibited Acts.

- (1) No individual or entity shall complete or maintain any cross-connection to a MCUD system, or cause such a cross-connection to be completed or maintained.
- (2) No connection to a MCUD system shall be performed or maintained by, for, or on behalf of the public potable water system unless the applicable on-site facilities of the customer or of the applicant for such connection are in compliance with the provisions of this Code.
- (3) There shall be no direct or indirect prohibited cross-connections, either existing or potential, between a safe public potable water system and an unsafe, non-potable supply, on the customer's side of the service connection.
- (4) Modification of any backflow prevention assembly shall be prohibited.

O. Inspections.

- (1) Inspection personnel may, with the customer's permission, inspect the private water systems of each customer's service address to determine the degree of hazard existing at the service address, and to ascertain compliance with the provisions of this ordinance and of related codes and regulations.
- (2) If the customer denies inspection personnel reasonable access for such inspections, MCUD may cause the installation, at the customer's expense, of the backflow prevention assembly or device(s) commensurate with the degree of hazard anticipated by inspection personnel for the water service connection.
- (3) If the customer denies reasonable access to perform such installations, MCUD may interrupt potable water service to any private water system connected to its public potable water system until such time that access is granted or a licensed installation or certified inspection is provided by the customer.

Table 6.15-1 Inspection schedule for installation of backflow preventers

Type of Service	Schedule
New connections with cross-connection hazards	Before service is initiated
Existing connections with WAC 246-290-490* Table 9-type hazards and other high cross-connection hazards	Within 90 days after notification
Existing connections with other than WAC 246-290-490* Table 9-type hazards or other high cross-connection hazards	Within 180 days after notification
Existing fire protection systems using chemicals or supplied by unapproved auxiliary water source	Within 90 days after notification
Existing fire protection systems not using chemicals and supplied by purveyor's water	Within 1 year after notification

*Washington State Administrative Code (WAC)

P. Backflow Prevention Assembly Testing.

- (1) Certification of backflow testers.
 - (a) All approved backflow testers must possess a current AWWA and/or American Backflow Prevention Association (ABPA) Backflow Tester certificate.
 - (b) Any backflow tester performing testing within Marion County shall maintain current status on MCUD's approved tester list. This list is comprised of certified testers that have provided a copy of their current certification and an annual calibration report for their test equipment.

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- (c) Test reports from unapproved backflow testers will not be accepted by MCUD and will not meet the requirements of this ordinance.
- (2) Testing.
- (a) Employees of Marion County are prohibited from testing privately owned backflow devices in the County, except as part of their official duties.
 - (b) Each testable reduced pressure principle assembly or double check valve assembly shall be professionally tested at least annually or as frequently as deemed necessary (for high hazards) by an approved backflow tester.
 - (c) The customer shall have the appropriate test conducted and shall submit the results to MCUD.
 - (d) MCUD shall provide written notice to their customers of the requirement for the test and the date that the test results are due. All testing shall be performed in accordance with the AWWA Manual 14, as amended.
- Q. Backflow Prevention Assembly Repair or Replacement.
- (1) Each testable reduced pressure principle assembly or double check valve assembly found to be functioning improperly shall be repaired or replaced at the customer's expense by a certified backflow installer.
 - (2) If any customer fails to provide the cross-connection control coordinator with proof of a passing certified test after repair or replacement, MCUD shall cause the repairs and test to be performed. Such repairs and testing shall be completed at the customer's expense.
 - (3) If the customer denies reasonable access to perform such repairs and testing, MCUD shall interrupt potable water service to the private water system(s) at the service address until such time that either access for or evidence of the passing certified test is provided by the customer.
- R. Emergency Acts.
- (1) MCUD shall interrupt water service to any private water system when necessary to prevent continued or potential backflow or cross-connection from a prohibited connection, until the requirements of this Code have been met.
 - (2) MCUD shall provide advanced notice of each interruption of service required by this Code, when possible.
 - (3) In the event of known pollution or contamination of a public potable water system or a customer's private water system due to backflow on or from the customer's service address, the customer shall promptly take reasonable steps to confine further pollution or contamination of the public potable water system and shall immediately notify MCUD.
- S. Enforcement.
- (1) The party or parties responsible for a violation of this Code shall be liable for all expenses, losses, or damage, including attorneys' fees and legal costs, incurred by the County by reason of such violation, including all costs and expenses associated with the interruption and restoration of potable water service for the service address where the violation occurred.
 - (2) If MCUD determines that a violation of this Code has occurred, MCUD may:
 - (a) Determine the actions necessary and appropriate to correct such violation;
 - (b) Determine the party or parties responsible either in whole or in part for such violation and require correction thereof;
 - (c) Determine the amount of any expense, loss, or damage incurred by the public potable water system as a result of such violation; or
 - (d) Assess the responsible parties for such amounts.
 - (3) In addition to any penalty or remedy provided by law for a violation of the provisions of this Code, the County may petition a court of competent jurisdiction to enjoin, restrain, or otherwise prevent any such violation or to recover expenses, losses, or damages pursuant to Section **6.14.7.R.1.**

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T. Penalties.

- (1) MCUD shall send a written reminder notifying the owner or authorized agent that the backflow prevention device or devices must be tested.
- (2) The first letter shall give the customer 30 days for the test to be completed.
- (3) Upon failure of the owner or authorized agent of the owner of the building or premises to have the device tested, a second letter shall be sent, via certified mail, explaining that if the test is not completed within 30 days there is a possibility of discontinuance of water service.
- (4) Upon failure of the owner or authorized agent of the owner of the building or premises to have the device or devices tested after the second letter, a third letter shall be sent via certified mail according to the conditions set forth under Ch. 162 FS. The third letter shall contain a date the water service will be discontinued.
- (5) Reconnection shall only be allowed with the submission of the successful backflow performance test results and payment of applicable fees.

Sec. 6.15.8 Water Well Standards.

A. Well Casings

- (1) Selection of temporary casings used only for construction shall be at the discretion of the contractor unless otherwise specified by the MCUD.
- (2) Permanent well casings shall be continuous and watertight from top to bottom of the casing except for well screens.
- (3) Permanent protective casings shall be provided for all types of well construction.
- (4) All well casings shall be Carbon Steel, unless otherwise required by MCUD.
- (5) All well casing manufacturing shall comply with the applicable ASTM, API, ANSI and AWWA standards.
- (6) Minimum well casing criteria shall comply with latest AWWA Standards (A-100-06).

B. Casing Diameters.

Table 6.15-2 Minimum Casing Diameters

Maximum Horizontal Dimension on Pump Assembly	Minimum Inside Diameter of Well Casing
4"	5"
5"	6"
6"	8"
8"	10"
10"	12"
14"	16"
16"	18"

C. Drive shoes.

Special, steel drive shoes shall be heat treated (Rockwell C Hardness 30-32) SAE 1040 steel ring or equal.

D. Installation.

- (1) Method of installation shall be at the option of the drilling contractor, provided the installation process does not alter the shape, size, configuration, or strength of the casing as called for in this section.
- (2) Seating or sealing of well casings shall conform to FDEP regulations.

E. Completion of well sites.

- (1) Contractor shall use reasonable precautions to prevent either tampering with the well or the entrance of foreign material or surface water into the well, at all times during the progress of the work.

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- (2) Contractor shall install a suitable threaded, flanged, or welded cap or compression seal to prevent any surface pollutants from entering the well upon completion of the well.
 - (3) The watertight casing of any well shall extend not less than 24" above the final ground level elevation and not less than 24" above the one percent (100-year) flood level of record, whichever is higher.
 - (4) Any equipment that will permit direct open access to the well shall also meet the height requirements and shall be sealed or screened to prevent entrance of foreign matter, surface water, or contaminants into the well.
- F. The ground immediately surrounding the top of the well casing shall be sloped away from the well to prevent surface runoff from entering the completed well.
- G. Well Screens.
- (a) The diameter of the well screen selected shall be the minimum size permitted that will maintain an aperture (slot) entrance velocity of 0.1 -1.5 fps or less and a vertical velocity not greater than 5 fps as determined in conjunction with the screen length formula below, based on the maximum flow in gallons per minute specified. In the event it is anticipated that the pump setting will be into or through the screen, the minimum inside diameter of the screen shall conform to **Table 6-14.1**. The actual design aperture entrance velocity shall be subject to approval of state and local regulatory agencies.
 - (b) Screen Length.
 1. The minimum length of a well screen shall be determined by the following formula:
$$L = Q / (A_c * V_c * 7.48)$$
Where:
L = Length of screen (feet)
Q = Maximum Flow (gpm)
 A_c = effective aperture area per foot of screen in square feet (The effective aperture area shall be taken as one half the total aperture area) (square feet/foot)
 V_c = design entrance velocity (fps)
 2. Other factors must be considered specifically for each individual well installation.
 - a. Information on the character of the water-bearing formation must be evaluated for proper well design.
 - b. When cost factors have limited the acquisition of additional aquifer data, a more conservative design criteria for entrance velocities is recommended.
 - c. Approach velocities, turbulent versus laminar flow, and velocity distribution, both into the screen and through the aquifer, are not automatically taken into account by the usual screen design criteria.
 - d. Screen length for a highly efficient well is determined by thickness and hydrogeologic character of the aquifer.
 - (c) Screen aperture size.
 1. For naturally developed wells, screen apertures shall be sized in accordance with the following criteria:
 - a. Where the uniformity coefficient of the formation is greater than six, the aperture size shall be that which retains 30 to 40 percent of the aquifer sample;
 - b. Where the uniformity coefficient of the formation is less than six, the aperture size shall be that which retains 40 to 50 percent of the aquifer sample;
 - c. If the water in the formation is corrosive or the accuracy of the sample is in doubt, select a size that will retain 10 percent more than is indicated in the preceding paragraphs; and
 - d. Where fine sand overlies coarse sand, use the fine-sand-size aperture for the top 2' of the

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- underlying coarse sand. The coarse-size aperture shall not be larger than twice the fine-sand size.
2. For gravel-packed wells, the screen-aperture openings shall be of such size to retain between 85 and 100 percent of gravel-pack material.
 3. The total aperture area of the well screen shall be that which will result in entrance velocities equal to or less than the casing velocities achieved from the diameter set forth in **Table 6.14.1**.
- (d) The well screen and its fittings shall be fabricated of Type 304 stainless steel unless otherwise specified.
- (e) Screens shall be designed to minimize the possibility of damage during installation, development, and use. The contractor shall submit screen strength specifications (for example, collapse and tensile strength) as well as supporting drawings and data to the owner.
- (f) Well screens shall be constructed by one of the methods described below, unless otherwise indicated by MCUD.
1. In punched or louvered pipe screens, adjacent openings shall be punched in pipe in such a way that no material is removed from the pipe wall. The spacing and size of openings shall be uniform.
 2. Wire-wound, continuous-slot well screen shall be of all-welded construction.
 - a. Special shaped wire shall be helically longitudinal rods and welded at each point of intersection.
 - b. The inlet-slot openings between adjacent turns of the outer wire shall widen inwardly so as to be nonclogging.
 - c. Screen end fittings shall be made of the same material as the screen body and shall be securely welded to each screen section.
 - d. Pipe conforming to the required well casing shall be perforated with uniformly spaced and sized round hole openings. Telescoped over this shall be a continuous-slot, Type 304 stainless steel screen.
- (g) Screen Joints and Spacers.
1. Joints between screen sections and blank pipe spacers shall be welded or threaded and shall be sand tight, straight, and as strong as the screen itself.
 2. Spacers between screen sections shall be of the same material as that used for the casing if greater than 5' long. If less than 5' in length, they shall be made of the same material as the screen.
 3. Joints between the well screen and the casing shall be sand tight and made by any one of the methods below:
 - a. A nonmetallic seal of neoprene or rubber made to fit the casing surrounding the screen shall be attached to the screen or screen casing to affect the seal, and the screen or screen casing shall extend at least 2' into the exterior casing; or
 - b. A lead packer shall be expanded to fill the space between the screen and the casing. This lead packer shall be manufactured for this purpose and be attached to the screen or screen casing; or
 - c. The space between the screen casing and the casing shall be filled with neat cement to form a seal at least 1.5" thick and 3' in length.
 4. Where the construction of the well is of the gravel-packed type, the screen casing overlaps at least 50' into the casing above, and the space between the two is filled with gravel, no other seal will be required unless specified by state or federal regulations.
 5. When the screen and casing are one continuous unit from the bottom of the well to the top of the well, joints shall be approved by MCUD.
- (h) Sealing the bottom of the screen.

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1. The bottom of the deepest screen or screen casing shall be sealed by any one of the methods below:
 - a. A threaded or welded plate shall be installed at the bottom of the screen or well casing extension. The plate shall be made of the same material as that used for the screen or the well casing to which the plate is attached; or
 - b. A self-closing valve shall be installed at the bottom of the screen or casing and shall then be covered by a cement plug at least 1' deep.
- (2) Gravel Pack.
 - (a) Thickness and Location.
 1. Selection of the gravel pack thickness surrounding the screen shall depend on individual aquifer characteristics.
 - a. Minimum thickness to allow for proper placement of gravel pack shall be 4";
 - b. The maximum gravel pack thickness shall not exceed 12".
 2. Placement of the gravel filter shall be made in locations adjacent to the well screens and shall extend above the screen at least 20'.
 - (b) Material and Impurities.
 1. The gravel pack material shall have an average specific gravity of not less than 2.5.
 2. Not more than one percent, by weight, of the material shall have a specific gravity of 2.25 or less.
 3. Thin, flat, or elongated pieces of gravel, the maximum length dimension of which shall not exceed three times the minimum width, shall not be in excess of two percent, by weight.
 4. Not more than five percent of the gravel shall be soluble in hydrochloric acid.
 5. The material shall be washed and free of shale, mica, clay, dirt, loam, and organic impurities of any kind.
 6. The materials shall contain no iron or manganese in a form or quantity that will exceed potable water standards.

Sec. 6.15.9 Wellfields and Water supply.

- A. Groundwater Protection.
 - (1) The wellhead protection area zones shall comply with **FAC 62.555** and all applicable Marion County requirements.
 - (2) The wellhead protection area zones shall be indicated for the proposed well or wellfield location indentifying the existing surrounding uses.
 - (3) Necessary precautions shall be taken to prevent contaminated water, or any other contaminates, from entering the water source, either through the well opening or by seepage through the ground surface.
- B. Surface water intake facilities design.
 - (1) Facilities shall comply with the design and installation requirements as established by **FAC 62.555**. The criteria set forth in the [Ten State Standards - Recommended Standards for Water Works](#) should be used as a design guide for the intake structures.
 - (2) Additional design standards and requirements stated in this Code shall also apply.
- C. Investigation of geologic/hydrologic conditions and groundwater quality.
 - (1) Geologic/hydrologic conditions and groundwater quality analysis shall be performed in accordance with FDEP and water management guidelines.
 - (2) All analysis shall be reviewed and approved by a professional engineer or qualified geologist.

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Sec. 6.15.10 Water treatment plants.

- A. Non-MCUD water treatment plants shall comply with FDEP and DOH requirements.
- B. MCUD owned water treatment plants shall be designed in accordance with FDEP, DOH, [Ten State Standards - Recommended Standards for Water Works](#), Florida Building Code, Florida Fire Prevention Code, and MCUD specifications. MCUD shall determine the sizing of the plant, water storage requirements, and pumping capacity, on a case-by-case basis, as determined by an engineer.
- C. Hydropneumatic tanks shall be ASME approved and steel construction. The tank and compressed air system shall be as specified by MCUD.

Division 16 Wastewater Facilities

Sec. 6.16.1 Purpose and Intent.

This division sets forth the general requirements for the design of a wastewater system.

Sec. 6.16.2 Decentralized systems.

- A. The decentralized WWTP shall be designed in compliance with FDEP and FDOH requirements and shall be constructed on a dedicated utility site, which will be preserved and protected for the WWTP, until connection to a centralized system is available.
- B. A decentralized WWTP which applied for a permit from Marion County after August 1, 2009, as per Ordinance 09-17, shall be taken out of service, deeded, or reclassified under any of the following conditions, which may be appealed to the DRC:
 - (1) The decentralized system owner will be responsible for providing the surveying, design, permitting, and construction of all components necessary to connect the decentralized wastewater system to the centralized system. After connection, all components of the wastewater system will be owned, operated, and maintained by the centralized system owner; or
 - (2) The MCUD Director and a centralized system owner has determined the WWTP is suitable for expansion or inclusion into the centralized system owners Public Service Commission (PSC) territory, the WWTP property and all improvements shall be deeded to the centralized system owner and reclassified as a centralized system; or
 - (3) If the MCUD Director determines that the size, location, or other factors show the decentralized system is not feasible for connection or inclusion into a franchised territory, the system will be reclassified as a centralized system. The reclassified system must be operated and maintained by an FDEP approved service company.

Sec. 6.16.3 Treatment Standards

- A. The treatment standards shall apply to all centralized and decentralized Wastewater treatment facilities (WWTF) in the SPZ.
- B. Any new or expanded WWTF shall meet the following applicable annual average effluent concentrations for Total Nitrogen (TN):

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Table 6.16-1 Total Nitrogen

Designed Average Daily Flow (in gallons per day)	Effluent Disposal System		
	RRLA	SRLA	PAR
Primary Protection Zone			
Greater than or equal to 500,000	3 mg/L	3 mg/L	10 mg/L
Less than 500,000 but greater than or equal to 10,000	3 mg/L	6 mg/L	10 mg/L
Less than 10,000	10 mg/L	10 mg/L	10 mg/L
Secondary Protection Zone			
Greater than or equal to 500,000	3 mg/L	3 mg/L	10 mg/L
Less than 500,000 but greater than or equal to 100,000	3 mg/L	6 mg/L	10 mg/L
Less than 100,000 but greater than or equal to 10,000	6 mg/L	6 mg/L	10 mg/L
Less than 10,000	10 mg/L	10 mg/L	10 mg/L

- C. If a facility is permitted by MCHD, then the system shall comply with the requirements under FAC 64E-6, Part IV, and this section, otherwise it shall comply with the requirements of the FDEP and this section.
- D. By January 1, 2019, the owner of an existing WWTF using Rapid-Rate Land Application (RRLA) as a primary disposal system shall:
 - (1) Connect to a central sewer system that does not utilize a RRLA disposal system; or
 - (2) Meet a 10 mg/L TN effluent limitation and either convert to a Slow-Rate Land Application (SRLA) system approved by the FDEP (including as an option a subsurface drip Irrigation system); or
 - (3) Convert to a public access reuse (PAR) disposal system; or
 - (4) Meet the following annual average reclaimed water limitations for TN:
 - (a) 3.0 mg/L for facilities having a DADF equal to or greater than 100,000 gpd; or
 - (b) 6.0 mg/L for facilities having a DADF less than 100,000 gpd.
 - (5) A waiver from these limitations may be requested provided the permittee or permit applicant makes an affirmative demonstration, based on relevant water quality data, physical circumstances, or other credible information, that the discharge of reclaimed water has not and will not result in more than a ten percent increase in background groundwater nitrogen concentrations at the disposal location.
- E. An affirmative demonstration shall include a site specific study based upon the following factors:
 - (1) The proximity to a spring, and natural and manmade interconnected surface and subsurface features.
 - (2) Ground water flow gradient.
 - (3) Discharge volume.
 - (4) Ground water quality data.
 - (5) Site-specific geological conditions.
- F. Effluent and Residuals Disposal.
 - (1) A RRLA system may also be permitted in the Primary SPZ provided the following:
 - (a) The WWTF is designed and permitted to utilize public access reuse and proposes to use a RRLA system only temporarily, until such time that 50,000 gpd or more is being generated, at which point the system shall serve solely as back-up as set forth under subsection b., below; or
 - (b) The system is used solely as back-up to a PAR system. In order to qualify as a back-up system, no more than 30 percent of the total annual flow may be directed to the back-up RRLA system if the WWTF is permitted to meet an annual average TN limitation greater than ten mg/L, and no more than 50

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percent of the total annual flow may be directed to the back-up RRLA system if the WWTF is permitted to meet an annual average TN limitation of six mg/L or less.

- (c) The WWTF is designed and permitted to meet the applicable effluent under subsection B, above.
- (2) New SRLA systems with restricted public access shall be limited to dedicated sprayfields.
- (3) All new and existing sprayfields shall be planted to hay or other sod-forming vegetation. During winter months, the sprayfield shall be over-seeded with ryegrass or winter-hardy grass to promote year-round nutrient uptake.
- (4) Any WWTF that provides PAR shall institute a program to educate the end user about the value and benefits of reuse. The program shall be designed to enable the user to easily calculate the amount of nitrogen was applied to the disposal area and, therefore, promote reduced use of purchased sources of nitrogen. The owners of the WWTF shall coordinate such program efforts with the County.
- (5) Monitoring.
 - (a) On or before December 31, 2009, the owner or operator of any new or existing WWTF with a DADF of 10,000 gallons or more shall test for effluent nitrate as N and TN at the point of discharge.
 - (b) Effluent nitrate as N sampling shall be performed at regular (i.e. non-selective) intervals at least monthly, except that TN sampling for facilities with a DADF less than 100,000 gpd may be performed quarterly.
 - (c) All test results shall be reported to the Zoning Official. Either the FDEP discharge monitoring report, or document provided by the Zoning Department may be used. This provision shall not be construed to require additional monitoring if the WWTF, as a condition of its FDEP permit, is already required to comply with comparable or more intensive requirements, nor shall this requirement apply to any facility that will, according to a County-approved five-year Capital Improvement Plan, be abandoned and/or connected to a central sewer system.

Sec. 6.16.4 Wastewater collection systems.

A. Design Criteria

- (1) The County will approve plans for new wastewater systems and extensions only when designed as separate systems in which precipitation, runoff and groundwater are excluded.
- (2) Sewers systems shall be designed with the following minimum peak factors.

Table 6.16-2 Minimum Peak Factors*

Flow Range	Peak Factor
Flows to 100,000 GPD	4.0
100,000 GPD to 250,000 GPD	3.0
Flow greater than 1,000,000 GPD	2.5

*Peaking factors less than 2.5 may be considered for ADF above 2 MGD, if substantiated by data provided by an engineer.

- (3) Pipe shall be located in dedicated rights-of-way or utility easements.
- (4) Pipe located outside of dedicated rights-of-way shall require a minimum 20' easement. If a pipe is located adjacent to a road right-of-way, a minimum 10' easement shall be provided. Additional easement widths shall be provided if the pipe size or depth of cover so dictate.
- (5) Gravity sewer shall be located under pavement unless otherwise authorized by MCUD.
- (6) Pipe shall not be placed under or within 10' of retention ponds, retention pond berms, or any vertical structures. Sewers shall not be located along side or rear lot lines.

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B. Gravity Sewer

- (1) No gravity sewer main conveying wastewater shall be less than 8" in diameter.
- (2) The minimum cover over gravity sewers shall be no less than 3' calculated from the finished grade. Exceptions to this requirement may be made for a short length of pipe where structural considerations are incorporated in the design.
- (3) All sewers shall be designed and constructed to give minimum velocities, when flowing full, of not less than 2 fps, based on Manning's Formula using an "n" value of 0.013. The following minimum slopes shall be provided:

Table 6.16-3 Minimum Slopes

Sewer Size	Minimum Slope in feet per 100 feet
8"	0.40
10"	0.28
12"	0.22
14"	0.17
16"	0.14
18"	0.12
20"	0.11
24" and larger	0.08

- (4) Where design velocities greater than 10 fps (only for peak instantaneous flows) are attained, due to topography or other reasons, special provisions shall be provided for sewer protection per **Article 7**.
- (5) Sewers shall be laid with uniform slope between manholes.
- (6) Size conversion between manholes shall not be allowed. All sewers shall be laid with straight alignments between manholes.
- (7) Main drain and back wash systems for pools and spas and storm drain systems shall not connect to the gravity sewer system.

C. Manholes

- (1) Manholes shall be installed as follows:
 - (a) at the end of each gravity sewer;
 - (b) at all changes in grade, size, or alignment;
 - (c) at all sewer intersections;
 - (d) at distances not greater than 400';
 - (e) a manhole shall be located immediately within the right-of-way to separate private sewer systems from the MCUD sewer system; and
 - (f) where sewer extensions for future connections terminate.
- (2) An outside drop pipe shall be provided for a sewer entering a manhole where the invert elevation is 24" or more above the manhole invert.
- (3) The manhole invert shall be filleted to prevent solids deposition when the difference in elevation between the incoming sewer invert and the manhole invert is less than 24".
- (4) Minimum inside diameter of manholes
 - (a) Sewers 24" in diameter and smaller, the minimum shall be 48".
 - (b) Sewers between 24" and 36", the minimum shall be 60".

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- (c) Sewers larger than 36" in diameter, minimum shall be 72".
 - (5) A minimum access cover diameter of 24" shall be provided for all manholes.
 - (6) The flow channel through manholes shall be made to conform in shape and slope to that of the sewers. Vertical and/or horizontal flow direction changes in excess of 90° shall not be included in sewer alignments without MCUD approval.
 - (7) Manholes, frames, and covers shall be constructed as specified in **Article 7**.
 - (8) A MCUD approved lining shall be required on manholes receiving force mains.
 - (9) Inflow prevention lids shall be required for all manholes.
 - (10) Access shall be required to all manholes located outside of roadways consistent with **Article 7**.
- D. Service Connections
- (1) Service connection shall be through a service lateral.
 - (2) A cleanout shall be provided at the property line.
 - (3) Service laterals and fittings shall be a minimum of 6" in diameter. All service laterals shall be less than 100' in length unless otherwise authorized by MCUD.
 - (4) Service laterals shall have a minimum slope of one percent.
- E. Wastewater Force Mains
- (1) Only 4", 6", 8", 10", 12", 16", 20", 24", 30", 36", 42", 48", and 54" diameter force mains shall be permitted.
 - (2) At design pumping rates, a cleansing velocity of at least 2.0 fps should be maintained. Maximum velocity at design pumping rates shall be determined by pipe material but in no case shall exceed 8 fps or exceed surge analysis in accordance with AWWA for ductile iron pipe (DIP) or PVC pipe. In no case shall velocity exceed surge allowances as per AWWA.
 - (3) Friction losses through force mains shall be based on the Hazen and Williams Formula. In the use of Hazen and Williams Formula, the value for "C" shall be 120 for DIP and 130 for PVC pipe. "C" values greater than 130 shall not be allowed. When initially installed, force mains may have a significantly higher "C" factor. The higher "C" factor should be considered only in calculating maximum power requirements and duty cycle time of the motor.
 - (4) The force main and fittings, including all restrained joint fittings and pipe restraints, shall be designed to withstand pump operating pressures and pressure surges, but not less than 100 psi. The design engineer shall determine the minimum length of pipe to be restrained on each side of the fitting.
 - (5) Force mains shall enter the gravity sewer system at a manhole not more than 1' above the flow line of the receiving manhole and shall have an MCUD approved liner.
 - (6) Valves
 - (a) Valves shall be in a manhole or a valve vault.
 - (b) Valves shall be clearly delineated on the force main profile in the drawings.
 - (c) Valve spacing shall not exceed 2,000'.
 - (d) Valves shall be easily accessible.
 - (e) Valves shall not be subject to flooding.
 - (f) Air release valves, or air/vacuum relief valves, shall be provided as necessary.
 - (g) Plug valves shall be provided at both ends of all crossings so that the section can be isolated for testing or repair.
 - (h) Sufficient plug valves shall be provided on force main systems to facilitate effective isolation of the pipe system for repairs and maintenance as determined by MCUD.
 - (i) Gear actuators shall be in accordance with **Article 7**.
 - (7) Aerial and underwater crossings shall be subject to approval by MCUD.

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- (8) Material, installation, and testing shall be determined utilizing provisions of Article 7.
- (9) A means for locating and identifying all force mains and valves shall be provided in accordance with the provisions in Article 7.
- (10) Provision for the installation of permanent access points into and egress points out of the piping system for pigging and cleaning purposes shall be incorporated into 8" and larger force mains. Pigging ports shall be located and incorporated within the lift station sites as determined by MCUD.

Sec. 6.16.5 Wastewater Pump Stations.

- A. Private Pump Stations shall be:
 - (1) Designed by an engineer and approved by FDEP;
 - (2) Not located directly adjacent to public thoroughfares; and
 - (3) Pump stations shall be located on fee simple tracts of land adjacent to rights-of-way, with the exception of private pump stations serving single owner properties.
- B. Private Pump Stations with flow to a MCUD system shall be:
 - (1) Designed by an engineer and approved by FDEP and MCUD per Article 7;
 - (2) Not located directly adjacent to public thoroughfares; and
 - (3) Pump stations shall be located on fee simple tracts of land adjacent to rights-of-way, with the exception of private pump stations serving single owner properties.
- C. Marion County pump stations shall be designed by an engineer, approved by FDEP, and conform to the following:
 - (1) Design
 - (a) Pump stations to be dedicated to and operated by MCUD shall be designed to MCUD specifications based on the size of the pump station.
 - (b) Pump stations shall have wet wells designed and constructed to serve the lowest developable point on all adjacent vacant tracts of land surrounding a project by means of gravity flow only. The appropriate sized utilities easement(s) shall be provided by the developer so the gravity wastewater mains from all surrounding tracts of land can easily be connected to the wet well of the pump station.
 - (c) The engineer shall submit the design and calculations for all wastewater pump stations to MCUD for review and approval. Calculations shall include:
 1. High head and low head condition system curves plotted on the manufacturer's pump curve;
 2. Hydraulic analysis of force main system including all friction and minor losses;
 3. Operating cycles with wet well sizing; and
 4. Buoyancy calculations.
 - (d) The design basis for all calculations shall provide for 60 percent of all receiving system pumps to be operating at design capacity at the time that the proposed pump station is to be operating.
 - (e) System curves shall verify that the pumps are operating at peak efficiency in accordance with the manufacturer's specifications and are suitable for the design flow application.
 - (f) Pump and motor selection shall be designed on the hydraulic grade line at the point of connection as based on the MCUD Master Plan and approved model for the utility service area affected by the proposed development.
 - (g) Each component of the pump station shall be designed to accommodate the development's design flow at the prevailing system conditions at the time of build out.
 - (h) Pump station structures, electrical equipment, and mechanical equipment shall be designed to be protected from physical damage by a 100-year 24-hour storm event. The bottom of all station control and electrical boxes shall be no lower than the one percent (100-year) flood plain flood elevation.

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- (i) Wastewater pump stations shall remain fully operational and accessible during a 100-year 24-hour storm event. The top elevation of the wet well shall be no lower than the one percent (100-year) flood plain flood elevation.
 - (j) The top elevation of the control panel shall not exceed maximum distance from the pump station's concrete pad that is allowed by Code, unless authorized by MCUD .
 - (k) The pump station site design shall ensure that positive stormwater drainage radiates outward from the center of the wet well to the boundaries of the site and away from the pump station site. Access driveways and roadways shall be designed to prevent stormwater conveyance onto the pump station site.
 - (l) The pump station and driveway shall be constructed in accordance with Article 7 and shall be readily accessible by maintenance vehicles during all weather conditions including a 100-year 24-hour storm event.
 - (m) A complete system for the control of odors shall be provided as required and specified by MCUD.
 - (n) A supervisory control and data acquisition capable control panel shall be provided and of type to match pump station configuration as specified by MCUD.
- (2) Site and Location
- (a) Pump stations shall be located on fee simple tracts of land adjacent to rights-of-way.
 - (b) No part of structure on the same side of the roadway, or less than 50' perpendicularly from the intersection of two or more rights-of-way.
 - (c) Permanent and temporary vehicular access to a pump station shall freely accommodate the turning movements of a 40' long and 9' wide single unit truck vehicle with a 28' wheelbase as specified by the Institute of Transportation Engineers. Vehicular backup distance shall not exceed 60'.
 - (d) Driveways to pump stations on residential roadways shall not be less than 30' in length from the pump station's gates to the adjacent roadway's edge of pavement or back of curb so as not to totally block both lanes of travel, unless approved by MCUD. The driveway length along all other roadways shall not be less than 45', unless approved by MCUD.
 - (e) Pump station sites shall be sized as delineated in the standard drawings for duplex and triplex stations per the pump station site plans.
 - (f) The developer shall dedicate the pump station site and driveway by plat or separate instrument to MCUD. Dedicated easements shall be shown as specified on the pump station site plans in the standard drawings.
 - (g) A minimum 20' wide utility easement that provides for ingress and egress to the pump station shall be required.
- (3) Pump stations shall be completely fenced to maintain and control access consistent with Article 7.
- (4) Emergency pumping capability shall be provided for all pump stations per FAC 62-604, or as required by MCUD. Generator specification and installation shall comply with requirements of MCUD and Article 7.

Sec. 6.16.6 Water Reclamation Facilities.

The design of water reclamation facilities shall be designed according to FDEP BMPs, current compliance standards, and MCUD requirements.

Division 17 Reuse Facilities

Sec. 6.17.1 Purpose and Intent.

This division sets forth the general requirements for the design of a reclaimed water system.

Sec. 6.17.2 Applicability.

MCUD shall evaluate the availability of reuse and information provided by the applicant to make a

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determination if incorporation into MCUD's reclaimed water system represents a beneficial use of the reclaimed water resource. The developer may appeal the determination of MCUD to the DRC.

Sec. 6.17.3 Developer's Agreement.

An executed developer's agreement for reuse distribution (irrigation) systems shall be required prior to receipt of potable water and wastewater service, if project is required to connect to MCUD reclaimed water system.

Sec. 6.17.4 Design standards.

- A. Approved and prohibited uses of reclaimed water shall comply with FAC 62-610, Reuse of Reclaimed Water and Land Application, Part III.
- B. The water reuse potential of a project shall be based on the anticipated irrigation demand at an annual average irrigation rate calculated consistent with water management district guidelines.
- C. Reclaimed water systems shall be designed to promote efficient reclaimed water usage and for the estimated ultimate irrigation demand, based on planned development build-out. The developer is responsible for sizing the mains within the development property limits (on-site). Individual single-family homes are exempt from providing design calculations for irrigation systems with one inch or smaller meters.
- D. Reclaimed water mains outside the development limits (off-site) shall be sized using the flow calculations and peak hourly factor below:
 - (1) The weekly reclaimed water flow shall be based on a minimum of 1 inch per week over the proposed irrigated area of the property.
 - (2) Peak hourly factor.
 - (a) For commercial developments, the peak reclaimed water flow shall be calculated by dividing the weekly flow by the allowed days of irrigation per week and multiplying the result by a peak hourly factor of six. Irrigation zones shall be provided to uniformly distribute flows so that the maximum peak hourly factor is not exceeded. Alternate irrigation system designs will be evaluated on a case-by-case basis.
 - (b) For single family residential developments, the peak reclaimed water flow shall be calculated by dividing the weekly flow by the allowed days of irrigation per week and multiplying the result by a peak hourly factor of six.
- E. Design Calculations
 - (1) Project Engineer or Landscape Architect shall submit signed, sealed and dated hydraulic calculations with the master plan and the plans for all reclaimed water distribution projects. Calculations shall show sufficient hydraulic capacity to transport peak flows. All head losses and minor losses shall be included in the calculations.
 - (2) An engineering submittal for proposed on-site storage ponds shall be submitted to MCUD for review and approval. The submittal shall include two copies of construction plans and an engineering report supporting the pond design. The submittal must meet the requirements of MCUD, as well as FAC 62-610.
- F. Location
 - (1) Reclaimed mains shall maintain a consistent alignment with respect to the centerline of the road when installed in rights-of-way.
 - (2) Reclaimed mains located outside of dedicated rights-of-way shall require a minimum 20' easement shall be provided if it is not adjacent to the road right-of-way.
 - (3) Reclaimed mains located adjacent to a road right-of-way shall have a minimum of a 10' easement.
 - (4) Additional easement widths shall be determined by MCUD, when necessary.
 - (5) Reclaimed mains shall not be placed under or within 10' of the high water line of retention ponds, retention pond berms, or any vertical structures.

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- (6) Reclaimed mains shall not be located along side or rear lot lines, except when approved by MCUD.
- (7) Proposed commercial and residential development offsite mains shall be extended a minimum of 10' beyond the furthest entrance to the development.

Sec. 6.17.5 Reclaimed Water Metering.

- (1) All reclaimed water service connections shall be metered.
- (2) A master metering system is required when reclaimed water flow dictates installation of a 4" or larger meter. However, the engineer must obtain MCUD approval before finalizing the metering system design.
- (3) Meter boxes shall not be installed in sidewalks, driveways or areas subject to vehicular traffic unless specifically approved by MCUD. Meters subject to vehicular traffic shall be installed in a traffic rated meter box.
- (4) All commercial, industrial, institutional, shopping centers, apartments, and condominium projects shall require installation of one meter to service the entire development.
- (5) Meters larger than 2" shall be installed by the developer. Installation of meters 2" and smaller will be performed by MCUD. Meters 1" or smaller in size will be installed underground in an approved meter box. Meters that are 1.5" and larger shall be installed above ground, within a utility easement adjacent to the public right of way.
- (6) Size of all meters shall be determined in accordance with current AWWA Standards and MCUD approval.

Sec. 6.17.6 Non-residential Irrigation wells.

- A. Existing or proposed wells may be utilized as a back-up supply of irrigation water in the case of an interruption of service from the reclaimed water system.
- B. Existing or proposed wells shall be protected from reclaimed water entering the well by a MCUD approved backflow prevention device.

Sec. 6.17.7 On-site storage.

- A. On-site storage may be required when the supply pipe requirement is 2" or greater. The volume of the on-site storage ponds or tanks shall be equal to or greater than the annual average daily demand during a 24-hour period and MCUD approval.
- B. On-site storage ponds shall be lined, operated and maintained by the pond owner.
- C. The pond shall include a level control device to avoid overflow.
The pond reclaimed water meter assembly shall include a MCUD approved pressure sustaining valve to protect the system pressure.

Sec. 6.17.8 Backflow prevention. Backflow prevention requirements shall be in accordance with **Section 6.14.7**.

Division 18 Fire Regulations and Prevention

Sec. 6.18.1 Purpose and intent.

All developments and commercial occupancies shall comply with the most current Florida Fire Prevention Code, as adopted by the State of Florida.

Sec. 6.18.2 Fire flow.

- A. For all subdivisions or commercial occupancies supplied by water systems, fire flow shall be supplied in accordance with the Insurance Services Office (National Board of Fire Underwriters) Fire Suppression Rating Schedule, "Needed Fire Flow" section. Reduced fire flow may be allowed if deemed appropriate by the Marion County Fire Rescue (MCFR).
- B. All new developments and new or altered commercial occupancies over 1,200 square feet in size, excluding single-family residences or duplexes, shall provide a fire department water supply as follows:

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- (1) Fire hydrant connected to a decentralized or centralized water supply system;
 - (2) Direct fire line and fire hydrant connected to a decentralized or centralized water supply system;
 - (3) Dedicated water supply tank when a decentralized or centralized water supply is not available. The water tank size shall comply with National Fire Protection Association (NFPA) 1142, Rural Water Supply.
- C. Fire hydrant locations shall comply with the following:
- (1) A fire hydrant shall be located within 500' driving distance of a commercial building.
 - (2) Fire hydrants shall be installed no greater than 1,000' apart.
- D. A fire department connection (FDC) shall comply with the following location requirements:
- (1) Within 500', driving distance, of commercial building.
 - (2) A minimum of 1.5 times the height of the building away from the building.
 - (3) Within 10 feet of a hard surface.
- E. Private fire hydrants supplied by a fire pump shall be tested annually by a certified fire protection company and a copy of the flow paperwork and current contact information shall be provided to MCFR.
- F. Newly installed fire hydrants shall have a blue reflective pavement marker on the roadway for easier identification of the hydrant location during nighttime operations. The blue reflector shall be placed in the center of the travel lane in front of the hydrant on the same side as the hydrant location.
- G. All new and existing fire hydrants caps and bonnet shall be painted in accordance with NFPA 291, Recommended Practice for Fire Flow Testing and Marking of Hydrants.
- (1) Fire hydrant barrels shall be painted as follows:
 - (a) Red barrel = fire hydrant supplied by public mains.
 - (b) Yellow barrel = fire hydrant supplied by private mains.
 - (c) Silver barrel = fire hydrant supplied by fire pumps.
 - (2) All draft hydrants shall be painted silver barrel with yellow caps and bonnets.
 - (a) Draft hydrants are standard fire hydrants but are supplied by a static water source. Normally these hydrants are not supplemented by a fire pump and rely on a fire department engine to draft from the source. These draft hydrants have little to no pressure and function similar to a dry hydrant tank.
 - (b) Signage shall be provided indicating "Draft Hydrant," red background with a minimum 4" white reflective letters.
 - (3) All dry hydrant riser connections shall be painted red in color.
- H. Dry hydrants permanently removed from service shall have the riser painted black in color. The standard 4.5 inch fire department connection shall be removed from the riser and the remaining pipe permanently capped. Removal of a dry hydrant from service must be approved by MCFR.
- I. New residential developments that are not required to tie into fire line due to distance in accordance with this Code shall provide fire flow by one of the following:
- (1) Install a central water system with a minimum of 6" fire line and fire hydrants placed every 1,000'; or
 - (2) Install a minimum 30,000 gallons storage tank(s) in accordance with NFPA 1142.
 - (a) Multiple tanks shall be connected.
 - (b) Tanks shall be connected to domestic water and the water level maintained using a ball float valve or other approved valve.
 - (c) It will be the responsibility of the owner to maintain operability of the system.
- J. For residential subdivisions, water distribution systems and/or water main extensions shall be designed and constructed with the following requirements:
- (1) Subdivisions with water systems

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- (a) New water systems or extensions of existing systems into new subdivisions shall be designed according to the provisions of NFPA Standard 24, latest version.
- (b) Fire flow capacity shall be provided according to the following table:

Table 6.18-1 Fire Flow Capacity

Distance Between Buildings	Fire Flow
Over 100'	500 gpm
31' - 100'	750
11' - 30'	1000
10' or less	1500

- (c) Needed fire flow is that amount of water, in gallons per minute, flowing in excess of the average peak domestic demand for two hours, with a residual pressure no less than 20 psi.
- (2) Subdivisions with individual private wells
 - (a) Fire flow shall be provided through a system meeting the requirements of NFPA Standard 1142, Rural Water Supply.
 - (b) When a water system is installed in a subdivision having private wells, fire flow shall be provided in accordance with **Subsection D.(1)** above.

Sec. 6.18.3 Gated Communities and Gated Properties

- A. With no exception, a siren activated switch shall be installed.
- B. Alphanumeric keypad or "coded" gate access is a satisfactory, secondary/backup method for public safety access.
 - (1) Codes for developments and commercial occupancies shall be forwarded to MCFR for verification and forwarded to the public safety communication center/dispatch for inclusion into the dispatch database.
 - (2) New or updated codes shall be placed on a business or HOA letterhead and sent to MCFR Prevention Division.
 - (3) One and two family gate codes may be recorded into dispatch database at the request of the owner.
- C. Gate shall have emergency release in the event of loss of power.
- D. Signage shall be posted indicating how to access in the event of emergency.
- E. Notification shall be made to MCFR once the gate is installed to arrange for testing and proper documentation.
- F. It will be the responsibility of the owner to maintain operability of the system.
- G. Minimum access shall have an unobstructed width of 20' and an unobstructed vertical clearance of not less than 13'6".

Sec. 6.18.4 Development in Wildland Urban Interface/Intermix Zones

When MCFR determines that existing or proposed improvements are located in a wildland urban interface/intermix area, a wildfire hazard severity analysis shall be provided for review and approval by the MCFR.

Sec. 6.18.5 Access Control Boxes

Access control boxes shall be as approved by the MCFR. Access control boxes allow the fire department to gain entry into the location in the event of activation of the fire sprinkler system or fire alarm system. The installation of an access control box will minimize damage to the location due to forcible entry methods used to investigate alarms.

- A. Locations Which Require Access Control Boxes

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- (1) Any new commercial construction that contains a fire sprinkler system or fire alarm system.
 - (2) Any existing commercial building which installs a fire alarm system or fire sprinkler system due to a change of use or code requirement.
 - (3) Any existing commercial building that contains a fire alarm or fire sprinkler system that performs interior alterations or modifications which require a permit.
 - (4) Any existing commercial building that contains a fire sprinkler system or fire alarm system that has repeated nuisance activations as determined by MCFR Prevention Division.
- B. Installation Requirements
- (1) Access control boxes must be approved by the MCFR and ordered using the approved form obtained from MCFR.
 - (2) Access control boxes shall be installed 6' off the ground on the outside of the building. Installation shall be near the main entrance unless prior approval is gained from MCFR Prevention Division.
 - (3) The owner/occupant shall be responsible for mounting and installing the box to the building.
 - (4) Installation of the access control box shall be completed prior to the final inspection by MCFR for building occupancy.
- C. The owner/occupant shall ensure that a current key, and any additional keys necessary to access fire alarm panel rooms or fire sprinkler rooms, is provided to the MCFR, to be secured inside the box.

Division 19 Outdoor Lighting

Sec. 6.19.1 Purpose and intent.

The purpose of this division is to provide for effective and efficient nighttime lighting while minimizing light pollution, glare, and light trespass to conserve energy and resources while maintaining nighttime safety, utility, security, and productivity.

Sec. 6.19.2 Applicability.

- A. All outdoor lighting shall be installed according to the provisions of this division, and all state and local electrical and energy codes.
- B. All outdoor lighting installed after **the adoption of this code (date)** shall comply with requirements included herein, including but not limited to: new lighting, replacement lighting, or any other lighting whether attached to structures, poles, the earth, or any other location, including lighting installed by any third party. Exceptions to this division are:
- (1) Lighting within a right-of-way or easement for the principal purpose of illuminating streets or roads. No exemption shall apply to any lighting within the right-of-way or easement when the purpose of the luminaire is to illuminate areas outside of the right-of-way or easement, unless regulated with a street lighting ordinance.
 - (2) Lighting for public monuments or statuary.
 - (3) Lighting solely for signs
 - (4) Temporary lighting for theatrical, television, performance areas, and construction sites.
 - (5) Underwater lighting in swimming pools and other water features.
 - (6) Low voltage landscape lighting.
 - (7) Temporary lighting and seasonal lighting provided that individual lamps area less than 10 watts and 70 lumens.
 - (8) Lighting that is only used under emergency conditions, or for hazard warning required by federal, state, or local authorities.
- C. All lighting shall follow provisions of this division however, any special requirements for lighting listed below shall take precedence:

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- (1) Lighting specified or identified in a Special Use Permit.
- (2) Lighting required by federal, state, or local law or regulations.

Sec. 6.19.3 Submittal requirements.

- A. Exterior lighting systems shall be designed by a licensed professional as authorized by the State of Florida.
- B. An exterior lighting plan which indicates the following is required for all development except single-family homes and duplexes:
 - (1) Signature and seal of the professional who prepared the plan;
 - (2) Locations of all proposed exterior lighting fixtures;
 - (3) Photometric data which covers the project site;
 - (4) Data table including:
 - (a) Mounting heights
 - (b) Fixture type
 - (c) Lamp technical specifications
 - (d) Description of lenses and optical systems

Sec. 6.19.4 Exterior lighting design standards.

- A. Outdoor lighting shall be achieved by using the lowest wattage of lamp as possible to provide the amount of light needed according to standards provided by the Illuminating Engineering Society of North America (IESNA).
- B. Lighting intensities for buildings, projects, or other uses not specifically regulated by this **division** (for example, athletic fields, courts, and swimming pools), shall be designed according to the standards provided by the IESNA. All such uses shall comply with this **division** for control of glare and light level at the property line by using hoods, visors, or similar shielding devices.
- C. To avoid conflicts, locations of all light poles and fixtures must be coordinated with the location of all trees and landscaping whether existing or proposed as shown on the landscape plan. Vegetation screens may not be employed to serve as the means for controlling glare. Glare control must be achieved through the use of shielding, fixture mounting height, wattage, aiming angle and fixture placement.
- D. Mercury vapor fixtures shall not be permitted.

Sec. 6.19.5 Lighting control requirements.

Controls shall be provided that automatically extinguish all outdoor lighting when sufficient daylight is available using a control device or system from a programmable lighting controller, building automation system, or lighting energy management system. All automatic systems shall have a battery or similar backup power or device.

Sec. 6.19.6 The following lighting requirements shall apply to all new developments excluding single family residences:

- A. All lighting, regardless of location, shall be designed to prevent direct glare and light spillage onto adjacent streets and properties.
- B. Maximum maintained illumination levels measured at finished grade on adjoining property within 25 feet of the property line of the project in question shall be no more than 1.0 footcandles if the adjoining property is zoned commercial and no more than 0.5 footcandles when the adjoining property is zoned residential or is an existing residential use within 100 feet of the property line.
- C. All luminaries shall employ IESNA cutoff or full cutoff light distribution designations and shall be fully shielded fixtures, or flat lenses to reduce glare or spillage, with the following exceptions:
 - (1) Luminaries that have a maximum output of 260 lumens per fixture (the approximate output of one 20 watt

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incandescent bulb), regardless of number of bulbs, may be left unshielded provided that fixture has an opaque top.

- (2) Luminaries that have a maximum output of 1,000 lumens per fixture (the approximate output of one 60 watt incandescent bulb), regardless of number of bulbs, may be partially shielded, provided the bulb is not visible, and the fixture has an opaque top.

D. Vehicular canopy lighting.

- (1) Light fixtures mounted on the underside of a canopy must be recessed or shielded full cutoff type so that the light is restrained to 85 degrees or less from vertical.
- (2) Lights may not be mounted on the top or sides (fascias) of the canopy.
- (3) Canopy fascias may be illuminated from within only.

E. Mounting heights.

- (1) Mounting heights shall be measured from the adjacent grade to the bottom of the luminous opening of the luminaire.
- (2) Except as otherwise noted in this **division**, the height of an outdoor lighting fixture shall be a maximum of 16 feet.
- (3) Mounting heights shall be in scale with the buildings on the project site; fixture heights shall not exceed the height of the building.
- (4) In large parking areas (over one acre in size) and in vehicular use areas, mounting heights shall not exceed 30 feet in height.
- (5) Lighting for recreation facilities such as, but not limited to, football fields, soccer fields, baseball fields, softball fields, and tennis courts, are exempt from the mounting height standards provided that all other applicable provisions are met.

- F. Building-mounted luminaries may only be attached to the building walls. The top of building-mounted luminaire fixtures may not exceed the height of the parapet, or the roof, or 25 feet above the adjacent finish grade, whichever is lower. All wall mounted fixtures shall be a full cutoff type fixture.

Sec. 6.19.7 Lighting maintenance.

- A. All new luminaries, including replacement of existing luminaries where housing structures and fixtures are replaced, must comply with the provisions and standards of this section.
- B. Exceptions to this section are as follows:
- (1) Emergency lighting required for public safety and hazard warning required by local, state or federal authorities.
 - (2) Outdoor lighting fixtures producing light directly by combustion of fossil fuel.
 - (3) Holiday lighting consisting of low wattage bulb of no more than 8 watts each.
 - (4) Lighting for roads.