

CITY OF LAKELAND

Engineering Standards Manual

VOLUME 2: PUBLIC WORKS

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SECTION 1. ROADWAY DESIGN AND CONSTRUCTION STANDARDS

1-1 GENERAL

Florida Statutes (the Florida Transportation Code) establishes the responsibilities of the State, Counties, and Municipalities for the planning and development of the transportation systems serving the public. The Code's purpose is to protect the safety and welfare of the public. The State of Florida Department of Transportation (FDOT) has developed and adopted uniform minimum standards and criteria for the design, construction, maintenance and operation of public roads. The City of Lakeland has adopted the FDOT – Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways as a manual that provides the basic guidelines for developing street and highway facilities with reasonable operating characteristics with a minimum number of hazards.

The purpose of this Manual is to provide uniform minimum standards and criteria for design, specifications and construction of public and private streets, highways, bridges, sidewalks, driveways, curbs, curb ramps, bicycle paths, refuse collection facilities, drainage and stormwater management facilities, water, electric and wastewater utilities. These standards provide basic guidelines for developing these facilities in order to maintain uniform and reasonable operating characteristics and shall be applied to all new construction projects and on all reconstruction projects to the extent that economic and environmental considerations and existing development will allow. In those instances where a design criteria, specification, method of testing, or construction is not specifically addressed in this Manual, then the governing authority will be that contained in the other manuals cited and referenced in this Manual.

The Director of Public Works shall have the ability to assign any rights or responsibilities specified in this Manual to staff members in the Public Works Department. The Director of Public Works shall have the ability to make minor changes to this manual.

1-2 ENGINEER OF RECORD/DUTIES AND RESPONSIBILITIES

(a) Design Stage

The Engineer of Record for a project is responsible for the design of the construction plans and specifications for those roadways, drainage and utility facilities, and other structures, as they may apply. The Engineer of Record is responsible for the conformance with the minimum requirements set forth in this Manual and with other applicable statutory rules, regulations or policies that would affect the design and operation of the constructed project. Construction plans and specifications submitted to the City shall include design data and calculations necessary for the City to provide adequate review of the submittal. The Engineer of Record shall certify these plans, specifications, and calculations.

(b) Construction and Inspection Stage

The Engineer of Record for a project shall make reviews and inspections from time to time, as required, in order that he can be reasonably assured that the project is substantially constructed in accordance with the plans and specifications that have received approval by the City. The Engineer of Record shall not solely rely on project inspection from individuals who are not directly under his responsible charge unless; the Certification is to be made by another Licensed Engineer who shall accept responsibility for project review and inspection.

(c) “Statement of Completion” and “As-built/Record Drawings”

Upon completion of a project, the Engineer shall provide a certification to the Public Works Director that states the project has been inspected and constructed in compliance with applicable municipal regulations. In addition, it shall further state that the project was constructed in substantial accordance with the plans approved by the City and that any deviations will not prevent the project from functioning as designed. The Engineer shall supplement his certification by utilizing and including a valid as-built survey signed and sealed by a Professional Surveyor & Mapper. See Section 1-32 for requirements for preparing the “As-Built/Record Drawing”. All dimensions both horizontal and vertical that differ from the approved plans shall be placed on the “As-Built/Record Drawing” and certified by a Professional Surveyor and Mapper before submitting to the City.

1-3 ROADWAY DESIGN AND CONSTRUCTION CRITERIA

Roadway design and construction criteria shall conform to the criteria contained within this Manual and, as referenced in criteria contained in the latest or current version of the following publications and other applicable publications:

- (a) FDOT – [Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways \(Florida Greenbook\)](#).
- (b) FDOT – [Standard Specifications for Road and Bridge Construction](#), Divisions II and III, as modified by Off-System LAP Specifications.
- (c) FDOT – [Flexible Pavement Design Manual](#).
- (d) FDOT – [Rigid Pavement Design Manual](#).
- (e) FDOT – [Pavement Type Selection Manual](#).
- (f) FDOT – [Utility Accommodation Manual](#).
- (g) FDOT – [Design Standards](#).
- (h) FDOT – [Florida Intersection Design Guide](#).
- (i) FDOT – [Drainage Manual](#).
- (j) FDOT – [Storm Drain Handbook](#).
- (k) FDOT – [Open Channel Handbook](#).
- (l) FDOT – [Hydrology Handbook](#).
- (m) FDOT – [Exfiltration Handbook](#).

- (n) FDOT – [Erosion and Sediment Control Manual](#).
- (o) FDOT – [Bridge Hydraulics Handbook](#).
- (p) AASHTO – A Policy on Geometric Design of Highways and Streets.
- (q) AASHTO – Standard Specifications for Highway Bridges.
- (r) AASHTO – Guide for Development of Bicycle Facilities.
- (s) Transportation Research Board, Special Report 209, [Highway Capacity Manual](#).
- (t) OSHA – All OSHA Safety Regulations.
- (u) USDOT, FHWA – [Manual on Uniform Traffic Control Devices for Streets and Highways](#) (MUTCD).
- (v) Americans with Disabilities Act Accessibility Guidelines (ADAAG).
- (w) Proposed Accessibility Guidelines for Pedestrian Facilities in the Right-of-Way (PROWAG)
- (x) FDOT Traffic Engineering Manual

Publications listed above shall be considered as an integral part of this Manual. References to “Department” or “FDOT” in these publications shall reference the City of Lakeland.

In addition, a note shall be placed on all subdivision and roadway plans that states:

NOTE: “All materials and workmanship for this project shall comply, as a minimum, with FDOT Standard Specifications for Road and Bridge Construction Divisions II and III, current edition. All quality control and testing shall conform to the latest FDOT and ASTM standards.”

1-4 STANDARD DETAILS & TYPICAL ROADWAY SECTIONS

(a) Standard Details

The Standard Details and Index Sheets contained in Section 4 are intended to serve as uniform standards, which represent minimum requirements. These Standard Details may be updated from time to time. They are to be supplemented by the standard details, design criteria, and specifications contained in the other manuals and texts that are referenced in Section 1-3 of this Manual.

(b) Roadway and Street Classifications

The street classifications as defined by the City of Lakeland Land Development Code typically as local streets or collector streets generally refer to residential streets. All streets for any use other than residential shall be considered Commercial or Industrial Streets. All roads and streets shall be constructed with a structural number in compliance with Section 1-10 of this Manual.

(c) Roadway Typical Sections

The roadway typical sections for both public and private streets proposed for construction within the City of Lakeland shall conform to the minimum criteria, guidelines and standards set forth in this Manual; examples of which are graphically illustrated in Section 4 of this Manual. These may be updated from time to time. These typical roadway sections are intended to serve as uniform standards, which represent minimum requirements and may be supplemented by more stringent criteria, guidelines and standards that may be contained in the referenced manuals. They may be modified with the approval of the Director of Public Works as specific site conditions may dictate.

(d) Reduced Pavement Width

The City also recognizes that certain types of local public and private streets may warrant consideration of a reduced pavement width. The following such situations may warrant such consideration:

1. Cul-de-sac Streets as defined by the Land Development Regulations, providing the street is never going to be extended.
2. Private internal roads in mobile home parks and multifamily developments shall have a minimum width of pavement of no less than twenty (20) feet and have a pavement structure as provided in Section 4 of this Manual. The minimum private right-of-way reservation may vary on a case by case basis but should be wide enough to maintain the road.

(e) Collector Streets

The geometric design and roadway typical section of a collector road will be determined by the design operating conditions of the facility pursuant to criteria contained in this Manual, and in other Manuals referenced in Section 1-3.

The minimum pavement width for non-residential collector streets shall be twenty-four (24) feet. The roadway sections and geometric design features required at a site shall be dependent on the operating conditions of the facility. The Director of Public Works shall determine the minimum design criteria for the proposed collector street or for modifications required to an existing collector street that is impacted by a development.

1-5 PUBLIC RIGHT-OF-WAY AND UTILITY/DRAINAGE EASEMENTS

(a) Minimum right-of-way widths are listed by roadway classification. Additional right-of-way may be required to provide for adequate drainage facilities, sidewalks, and utilities. Public utility and/or drainage easements may be substituted in lieu of actual dedicated right-of-way on Local Streets where the minimum right-of-way

widths are consistent with the requirements contained in this manual, or as approved by the Director of Public Works. When combination easements are proposed such as for drainage and utilities in one location they shall be of sufficient width to accommodate the utilities proposed (i.e. storm sewer and sanitary sewer may have to be a minimum distance from a potable water line). When constructing new collector or arterial roadway and it is anticipated that widening will occur, sufficient right-of-way shall be provided to widen the road without encroaching on exclusive utility easements.

<u>Roadway Classification</u>	<u>Urban Section R/W</u>	<u>Rural Section R/W</u>
Alleys	20' min.	Not applicable
Local Street	50' min.	72' min.
Collector Street (two lane)	80' min.	100' min.
Collector Street (four lane)	100' min.	120' min.
Arterial Streets & Highways	140' min.	160' min.

For the purposes of this section, Urban Section shall include curb or curb and gutter sections. Rural Section includes the use of roadside ditches or swales.

Variances to utilize right-of-way widths of less than the values shown above will require approval by the Director of Public Works and the Planning and Zoning Board.

(b) Right-of-Way Donations

When developing along existing roadways and inadequate right-of-way exists, the City may request a donation of additional right-of-way as a condition of construction plan approval. The amount will be determined by the Roadway Classification given above. Some typical examples of inadequate right-of-way include room for sight distance, clear zones, sidewalks, roadside ditches, and future widening.

1-6 CLEARING AND GRUBBING

All roadway rights-of-way shall be cleared and grubbed in accordance with the FDOT Standard Specifications for Road and Bridge Construction. During all clearing and grubbing activities and until the project site is complete, fugitive dust shall be controlled by approved FDOT methods.

1-7 SUBSOIL INVESTIGATION FOR ROADWAYS

A subsoil investigation report, along with soil borings, shall be submitted with road, drainage and utility plans and shall include:

- (a) Seasonal high and existing groundwater elevation data at each boring location.

(b) At least two (2) borings to a minimum of five (5.0) feet below the existing or proposed profile grade (whichever is deeper) for roadways five hundred (500) feet or less. For roadways longer than five hundred (500) feet, borings shall be taken at a spacing no more than five hundred (500) feet. All soils from the borings shall be classified in accordance with AASHTO M 145-73. Additional deeper borings may be required in mined areas or areas adjacent to wetlands to determine the limits of unsuitable materials. Vertical and horizontal extent of muck, or other unsuitable materials shall be determined.

The Engineer of Record shall provide a plan to remove the unsuitable material within the proposed right-of-way. Alternative designs other than removal of unsuitable material may be considered when the unsuitable material exceeds ten (10) feet in depth subject to the approval of the Director of Public Works.

1-8 DESIGN CRITERIA FOR ROADWAY SUBGRADE

Stabilized Subgrade shall be constructed and tested in conformance with the FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways and the FDOT Standard Specifications for Road and Bridge Construction Section 160.

1-9 BASE COURSES FOR FLEXIBLE PAVEMENTS

Base course material normally used is limerock. The use of this material is reflected in the roadway Typical Sections shown in Section 4 of this Manual. The Director of Public Works may approve other alternate base course materials when special design conditions justify such use. These alternate materials include any FDOT approved base course as referenced in FDOT Design Standards Index 514. All materials, construction and testing shall conform to FDOT Standard Specifications for Road and Bridge Construction Section 200. If limerock base material is approved for construction, the thickness and density shall not be less than the following:

<u>Type of Development</u>	<u>Minimum Compacted Base Depth</u>
Local Residential Street	6"
Residential Collector Street	8"
Commercial or Industrial Street	8"

If an alternate base material is approved for use, equivalent minimum densities must be achieved. Base materials and plant mixes including plant, methods & equipment shall be certified in accordance with the FDOT Standard Specifications

for Road and Bridge Construction. Base material certifications and plant mix certifications shall be submitted to the Department of Public Works by the Engineer of Record for review.

(a) Prime and Tack Coats

Prime and tack coats shall be applied in accordance with FDOT Standard Specifications for Road and Bridge Construction Section 300.

1-10 SURFACE COURSE FOR FLEXIBLE PAVEMENTS

(a) Requirements

Hot bituminous mixtures – plant, methods, & equipment shall conform to FDOT Standard Specifications for Road & Bridge Construction. Surface courses for flexible pavements shall be FDOT Superpave and shall meet the following minimum thickness requirements.

Roadway Classification	Minimum Asphaltic Concrete Surface Course*	Minimum Type
Local Residential	1¼"	Superpave (Traffic B)
Residential Collector	1½"***	Superpave (Traffic B)
Commercial or Industrial Street	2"	Superpave (Traffic C)

*A pavement design in accordance with the FDOT Flexible Pavement Design Manual shall be required when either of the following criteria are met:

1. Projected AADT is at or above four thousand (4000) vehicles per day (VPD)
2. Projected truck percentage is at or above 5%

**The minimum surface course thickness for Residential Collectors shall be two inches (2") if projected AADT is at or above three thousand (3000) vehicles per day.

Friction course shall be used when required by the FDOT Flexible Pavement Design Manual.

(b) Materials and Construction

Superpave Asphaltic Concrete shall conform to the FDOT Standard Specifications for Road and Bridge Construction for materials and method of construction. The maximum allowable percentage of RAP shall be twenty percent (20%).

(c) The method of determining the roadway sub-base and pavement thickness for Standard Typical Sections shown in Section 3 has been calculated by the

structural number criterion as set forth in the FDOT Flexible Pavement Design Manual.

Using these criteria, the minimum structural number allowable for any residential roadway section design for Local Streets shall be 2.59. The minimum structural number of a residential collector shall be 3.06. The minimum structural number allowable for a street to be constructed in a commercial or industrial zoned area shall be 3.28.

Where the Developer desires to present an alternate combination of roadway subgrade, base and pavement design typical section, the structural number of the alternate roadway section shall meet the minimum structural number criteria established above. The Director of Public Works reserves the right to disapprove roadway typical sections not consistent with those shown on the details contained in Section 4 of this Manual.

(d) Plant mix design certification and/or coring tests of base and pavement will be required on all public and private streets. The frequency of coring tests will be, at a minimum, as established in the FDOT Specifications, for Road and Bridge Construction, or as specified by the Department of Public Works. The expense of all required tests shall be that of the Developer or contractor.

1-11 CONCRETE PAVEMENT

Concrete pavement must conform to the FDOT Standards for Road and Bridge Construction and the FDOT Rigid Pavement Design Manual. The Department of Public Works will not routinely approve rigid pavement except in limited applications. Justification must be provided in accordance with the FDOT Pavement Type Selection Manual and approved in writing by the Director of Public Works.

1-12 INTERSECTION CORNER RADII

Refer to Standard Detail Drawing in Section 4 of this Manual for criteria establishing minimum intersection corner radii.

1-13 UNUSED

1-14 DRIVEWAYS

Driveways installed within the public right-of-way within the City of Lakeland shall be constructed in accordance with the provisions of this Manual and no driveways shall be constructed until a Right-of-Way Use Permit has been obtained from the City for such construction.

The materials and specifications for the installation of standard residential driveways are shown on the details contained in this manual. Residential driveways shall be concrete with flares with a four (4) foot wide area at a maximum cross slope of two percent (2%) in compliance with the Americans With Disabilities Act (ADA) unless a waiver is granted by the Director of Public Works. All driveways adjacent to curb shall have a minimum 5-inch rise in grade above the edge of pavement in order to reduce the likelihood of roadway runoff draining over the driveway unless a waiver is granted by the Director of Public Works. Refer to Standard Detail 515 and FDOT Index 515.

The driveway materials and specifications for commercial and industrial development connecting to roads with low traffic volume, very limited semi-truck traffic and urban in nature will typically be concrete with flares. For normal commercial and industrial driveways, the geometric requirements will be according to the FDOT Design Standards, Standard Index 515. Refer to Index 515 for paved driveways for access by heavy semi-trucks or high traffic volumes. Intersection design standards including turn lanes and traffic signals may be required and approved in site-specific cases. In all cases commercial and industrial driveways shall provide for moving traffic off the road as quickly as possible without impeding traffic on the main road. Commercial and industrial driveways may be either flexible pavement or concrete; however, flared sections shall always be concrete and radial returns shall always be asphalt meeting intersection design standards. Driveway design criteria of the FDOT Design Standards, and FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways shall be used when not addressed in this manual.

The City does not maintain private streets, alleys, parking spaces, or driveways. The City will maintain the auxiliary lanes and turn lanes on public streets. Private property owners are responsible for the maintenance of private streets, alleys, parking spaces, and the portion of private driveways within the public right-of-way. If the portion of a private driveway within the public right-of-way becomes a hazard to the public, the property owner must repair the driveway at his sole expense after obtaining a driveway permit from Building Inspection to make said repairs. If after notice, the owner does not make repairs in the time specified by the City, the City may make improvements to eliminate the hazard and bill the owner for the cost of such repairs.

Where acceptable curb reveal exists as defined in Section 1-38 of this Manual, driveways shall be constructed flush with the existing edge of pavement. Where acceptable curb reveal does not exist, driveways shall be constructed up to one inch lower than existing edge of pavement to accommodate future milling and resurfacing to address curb reveal.

When access management is required by the City, the geometry of the access management measures must conform to standards established by the FDOT. Access management restrictions to private driveways may include limiting the

number of driveways and their location to a property, placement of traffic islands or medians to channel or restrict turning movements to and from driveways, and restricting traffic patterns to one-way entrance and exit movements.

During the site plan review process, existing driveways or curb cuts to be abandoned or no longer used shall be shown and appropriate details included for removal and reconstruction of any sidewalks, curb, or roadway repairs along the roadway frontage as necessary to meet current ADA standards. Private driveways being constructed to or removed from the State Highway System, County Road System, or City Road System, require approval from the respective governing agency. Any work in the ROW on City streets will require a Right of Way Use Permit and any other required permits on County and State Roads shall be available for review by the Public Works Inspector prior to beginning such work.

Driveways installed within private property may be of any material that provides a grassed or hard surface and have suitable structural characteristics to support emergency vehicles. Driveways, roads, or sidewalks on private property shall be designed in accordance with the specifications deemed appropriate for the type of construction proposed. Enhanced driveway features (such as brick pavers or driveway paint) are installed within the right-of-way at the owner's risk. If the City replaces a driveway it is only required to be replaced in accordance with the standards referenced in this manual.

(a) Design Exceptions - All driveways shall comply with the Americans with Disabilities Act (ADA) and all Federal and State regulations without exception. The following variances to these driveway standards are allowed for existing single-family residential or light commercial driveways located on a local street with a speed limit of twenty-five (25) miles per hour or less:

The property owner served by a driveway may elect to use a driveway as narrow as 10 feet wide and with flares as narrow as four (4) feet wide.

The property owner served by the driveway may elect to replace it at the existing driveway width, as measured at the property line, in the same location and with flares as narrow as four (4) feet wide.

The property owner served by a driveway within the Historic Districts may elect to replace it at the existing plan-view shape in the same location as the existing driveway with modifications as necessary to comply with ADA. These modifications include incorporating a minimum 48-inch wide path of travel through the driveway for pedestrians at a 1.5% design (2.0% maximum) cross slope.

Property owners are cautioned that using these variances may limit the entry speed of vehicles entering the driveway. Property owners may utilize the variances above at their own risk. The City of Lakeland assumes no liability associated with driveways utilizing these variances.

1-15 SIDEWALKS

Sidewalks shall be installed within the public right-of-way of the City of Lakeland and be constructed in accordance with the provisions of Ordinance No. 4580. No sidewalk may be constructed within City maintained right-of-way until a Right-of-way Use Permit has been obtained from the Public Works Department's Engineering Division for such construction.

In cases where inadequate right-of-way exists and the need for a sidewalk is evident, such as a collector road near a school, the Director of Public Works may request the Developer to donate either additional right-of-way or a sidewalk easement and construct a sidewalk at no cost to the City.

In the cases where development occurs adjacent to a sidewalk streetscape and modifications to the streetscape are required, the Developer shall be responsible to repair or replace the streetscape in a manner to match the existing streetscape. Authorization for a Developer to construct streetscape improvements within City right-of-way shall be by Right-of-Way Use Permit.

In an urban section, sidewalks shall be located a minimum distance of thirty (30) inches behind the back of a non-mountable curb and the sidewalk shall have a minimum width of five (5) feet. When constructed along the back of the curb, sidewalks shall have a minimum width of six (6) feet. Sidewalks constructed along a road with no curb shall be located a minimum distance of six (6) feet from the driving lane or outside the roadside clear zone whichever is greater. Curb ramps shall include yellow detectable warning surfaces in compliance with FDOT Index 304.

The material and specifications for the installation of standard sidewalk are provided in FDOT Index 310 and Standard Details 304 and 515. Refer to FDOT Index 304 for curb ramps.

Any request to vary from the criteria for sidewalk construction set forth in the Lakeland City Code or this Manual, will be considered on a case by case basis by the Director of Public Works. Such requests may be granted if it can be demonstrated that the proposal exceeds the minimum standards set forth in the FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways.

1-16 ACCELERATION – DECELERATION LANES

Acceleration-deceleration lanes shall be provided, in accordance with criteria set forth in the FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways, the FDOT Road and Traffic Design Standards, or as required by the Director of Public Works due to special conditions.

1-17 BRIDGES

(a) Bridges shall be constructed of precast concrete, prestressed concrete or cast in place concrete, unless otherwise approved by the Director of Public Works.

(b) Bridge design shall conform to the design criteria of the FDOT [Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways \(Florida Greenbook\)](#), AASHTO Standard Specifications for Highway Bridges, FDOT Design Standards, the FDOT Standard Specifications for Road and Bridge Construction, and other applicable design standard specifications relevant to the approved construction material and construction practices.

(c) The design truck loading shall be a minimum of HS 20-44. Four (4) sets of signed, sealed, and dated bridge design calculations shall be submitted by the Engineer of Record to the Department of Public Works.

(d) Foundation investigation, design reports and testing are required and shall be in accordance with FDOT and AASHTO Standard practices, and shall be submitted to the Department of Public Works by the Engineer of Record for review.

(e) All engineering design revisions shall be reviewed and approved by the Director of Public Works prior to construction.

1-18 ROADWAY ALIGNMENT

Roadway alignment shall be designed and constructed in accordance with the criteria set forth in the FDOT [Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways \(Florida Greenbook\)](#). A minimum longitudinal grade of 0.30% is required for all urban design sections. The grade of a rural design section will be dependent upon the specific topographic features of the area.

1-19 ROADSIDE CLEAR ZONE

The width of the clear zone should be as wide as practical. The minimum permitted widths shall comply with minimum requirements given in the FDOT Manual of Uniform Minimum Standards for Design Construction and Maintenance for Streets and Highways. Miami curb is not considered curb as it relates to measuring the Clear Recovery Area.

1-20 SIGHT DISTANCE CRITERIA

Whenever a driveway, roadway, or other access is created or modified it shall be designed to have proper horizontal and vertical sight distance free of obstructions. The design may include proper location of the access, trimming vegetation, carefully locating or relocating walls, or donating additional right-of-way to assure

a proper and safe site triangle is provided. In addition, for streets and highways, the designer shall consider all issues of sight distance. This will include checking the vertical and horizontal alignment to assure vertical curves are used to achieve the required stopping distance in both day and night. Refer to the criteria set forth in the FDOT Manual of Uniform Minimum Standards for Design Construction and Maintenance for Streets and Highways.

Further, reference is made to Section 4.12 “Visibility at Intersections” of the City of Lakeland Land Development Code and Section 90-3 “Obstructions to view at street corners” of the City of Lakeland Code of Ordinances or “Municode.”

1-21 MEDIANS, ISLANDS AND PARKWAYS

Medians, islands, and parkways may be authorized and in some cases required within the public right-of-way by the Department of Public Works. The plat dedication or other legal authority must clearly stipulate that the maintenance, including vegetative maintenance of the area is to be the sole responsibility of a private individual, group or association and that proof is provided that the maintenance of the improvements will be perpetual. The maintenance of the median, islands and parkways must ensure that their presence does not become a site obstruction.

Medians shall be curbed and conform to requirements of the FDOT Standards. All median turn lanes shall be developed in accordance with the applicable Florida Department of Transportation’s Design Standards and shall provide sufficient clear unobstructed sight distance consistent with the requirements contained herein.

1-22 STRUCTURAL IMPROVEMENTS WITHIN PUBLIC RIGHT-OF-WAY

No private structural improvements including but not limited to walls, posts, fences, gate houses, private identification signs, or other encroachments, shall be constructed or placed within the public right-of-way unless approved by the Public Works Director. Public or quasi-public improvements such as utilities, bus shelters, telephone booths, newspaper racks, or benches will be considered, providing they do not create a traffic or pedestrian hazard and do not limit sight distance at intersections. When encroachments are authorized, a Right-of-Way Use Permit must be obtained from the Public Works Department prior to construction. A building permit may be required for the installation of certain structural improvements. This permit must be obtained from the Building Inspection Department.

Mailboxes are exempt from permitting and may be placed in the right-of-way providing they meet all United States Postal Service requirements and comply with the FDOT Design Standards, or AASHTO’s Guide for Erecting Mailboxes on Highways. Typically, mailboxes should be mounted on a breakaway type post. When constructing congregate or multiple mailboxes or a mailbox on a non-break

away pedestal they shall be constructed in conformance with FDOT roadway safety requirements including maintaining a roadside clear zone as specified in this manual.

1-23 SODDING OR GRASSING AND MULCHING

All right-of-way other than paved and concrete areas shall be sodded or seeded and mulched in order to prevent erosion within the project limits. All sodding or seeding and mulching shall be in accordance with the materials and construction practices set forth in the FDOT Standard Specifications for Road and Bridge Construction. Typical drainage features such as berms, slopes, swales, and ditches shall be sodded. Areas subject to erosion such as along the back of curbs, along the edge of pavement (when no curb is used), around mitered ends, around inlets, and concrete surfaces shall be sodded. Proper temporary irrigation shall be provided until the vegetation is established.

1-24 BICYCLE FACILITIES

Transportation facilities and recreational trails for bicycles shall be developed in accordance with the criteria set forth in the FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways and the AASHTO Guide for Development of Bicycle Facilities.

In the development of new streets and highways and in the reconstruction of existing streets and highways, bicycle facilities in the form of either of the following shall be considered and evaluated as to the applicability of incorporating such features into the project design.

1-25 EROSION CONTROL

Erosion control shall be provided and maintained in accordance with the FDOT Erosion and Sediment Control Manual, the City of Lakeland Land Development Code, and the City's National Pollution Discharge Elimination System Permit. The Developer shall make all practicable and necessary effort to control and prevent erosion and sediment transport during the construction of a project to surface waters of the State or to adjoining properties. The design and maintenance of erosion and sediment control shall utilize Best Management Practices (BMP) in accordance with the City's Land Development Regulations.

Installation of Controls – No clearing, grading, cutting or filling shall commence until erosion and sedimentation control devices have been properly installed, in accordance with an approved plan between the area to be disturbed and adjacent property, water bodies, water courses and wetlands. Clearing and excavation required for installation of erosion and sedimentation control devices is allowed provided no activity occurs beyond five (5) feet of the control devices as specified on the approved plan.

Method of Control – Erosion shall be minimized and sediment retained on the site through application of Best Management Practices (BMP) approved as part of the applicable permits. Methods of control shall be suitable for site size, vegetative cover, soil type, slope, design features and proposed construction sequence and activities. Maintenance of Controls – once properly installed erosion and sediment controls must be maintained until a permanent vegetative ground cover is established. Any site or portion thereof where work is not being performed as part of the current phase of development and which remains cleared for over thirty (30) days, shall be stabilized. All disturbed areas shall be permanently stabilized through the establishment of appropriate vegetative ground cover upon completion of development activities on the site.

Erosion & Sediment Control Notes

1. All practicable and necessary efforts will be taken during construction to control and prevent erosion and transport of sediment to surface drains, wetlands, surface waters, and adjoining properties.
2. All site grading shall direct stormwater runoff to the detention and/or retention areas.
3. Revegetation and stabilization of disturbed ground surfaces will be accomplished as rapidly as possible to prevent erosion from occurring and reduce the sediment load into the discharge waters of the State or USA. All areas disturbed during construction shall be grassed and mulched, or sodded.
4. All areas subject to erosion shall be regraded and properly maintained with protective measures such as vegetation, turfing, mulch, synthetic bales, stabilizing, fibrous materials riprap, etc. to control erosion with a minimum maintenance and to reduce dust conditions.
5. A sediment barrier will be installed around the construction site perimeter and inlet protection installed on all storm drain inlets to prevent siltation of adjacent properties, storm drains, and surface waters. The sediment barriers and inlet protection will remain in place until all exposed surfaces are stabilized.
6. The downstream turbidity screening will remain in place for the duration of the project construction. Turbidity screening (and any other BMP utilized) will be removed by the contractor once site stabilization is achieved or the project punch list items are completed (whichever occurs first).
7. Soil tracking prevention devices shall be installed and utilized at all egress locations from the active construction area.

Drainage Facilities Operations & Maintenance

1. Bank side slopes shall be maintained against wash and erosion.
2. All silt and other materials that accumulate in the pond bottom, underdrains, exfiltration beds, swales, ditches, pipes, etc. shall be removed.
3. All retention areas and adjacent areas shall be mowed and kept clean of all trash and debris. All grass cuttings, trimmings and other organic sediment shall be raked and removed.
4. Retention area bottoms and side slopes are to be cleaned and regraded by the Owner as required to maintain the effective depth and volume and rate of percolation.

1-26 UTILITY INSTALLATIONS WITHIN PUBLIC RIGHT-OF-WAY

All construction activities within the City right-of-way shall require a Right-of-Way Use Permit from the Public Works Department prior to performing any work in the right-of-way. All construction activities shall comply with the FDOT Utility Accommodation Manual. Note that Non-Utility Right-of-Way Use Permits will be required to limit the duration of closures allowed to minimize the impact to the public and businesses in the area.

(a) General (City-Maintained Right-of-Way)

Where it is necessary for utilities to locate or relocate within the public right-of-way, the placement and location shall be consistent with the requirements of this Manual. Utility poles and above ground utility structures are not generally permitted in medians or within roadside clear recovery areas. Underground utilities should not be buried under the pavement when other space is available within the right-of-way. Unavoidable crossings of the street should be designed to allow for repairs and modifications without unnecessary disruption or hazard to traffic. Prior to the issuance of the Right-of-Way Use Permit, the Developer/Contractor shall submit proof of insurance to the City's Office of Risk Management. The insurance coverage must meet the requirements of the City.

The Developer/Contractor shall be responsible for maintaining traffic control and work safety during the entire utility installation. Work site safety shall conform to Part VI of the MUTCD and to the criteria set forth in the FDOT Design Standards 600-Series Indexes. Such installations shall require the issuance of a City of Lakeland Right-of-Way Use Permit.

(b) Underground Utility Crossings (City-Maintained Right-of-Way)

Underground utility crossings of paved City-maintained streets are to be by either the “Jack and Bore” or “Directional Bore” methods. Neither “Air Jetting” nor “Water Jetting” methods will be allowed. Where extraordinary circumstances preclude the use of the “Jack and Bore” or “Directional Bore” methods of utility crossing, the Director of Public Works may authorize an open cut trench across the paved street. The open cut shall then be repaired according to this Manual.

The casing for Jack and Bore installations shall maintain a minimum of thirty-six (36) inches of cover from the low edge of the roadway pavement to the outside diameter of the casing. The casing shall extend three (3) feet past the back of curb in an urban design section and a minimum of three (3) feet past the edge of pavement in a rural design section. (Refer to Section 3, Index 710 for additional information and requirements for utility crossings).

Directional Bores shall be at a minimum depth as required in the FDOT Utility Accommodations Manual. When these depths are not reasonably achieved, the Public Works Chief Inspector may authorize a depth as shallow as four times the reamer diameter but not less than thirty-six (36) inches, as measured from the edge of pavement to the top of the reamer, when the following conditions are met by the Developer:

- 1) Photograph the roadway at the boring location before and after the boring operation.
- 2) Mark and survey a minimum of two points per travel lane in the vicinity of the bore (one on each side of the bore) before and after the boring operation.
- 3) If the roadway shows evidence of damage or if the survey points show more than $\frac{1}{4}$ inch vertical variation between pre-and post, mitigation will be necessary. It shall be discussed with and approved by Public Works.

All methods of installation are subject to the review, approval and inspection by the City of Lakeland. Traffic control at the project site shall be maintained during all stages of the operation.

(c) Utility Installations (County and/or State Maintained Right-of-Way)

Utility installations within County and/or State maintained right-of-way shall require the Developer/Contractor to obtain a permit from the agency who has maintenance jurisdiction of the road. This permit shall be on-site and available for inspection at all times.

1-27 CITY, COUNTY, STATE, AND FEDERAL PERMITS

Prior to the development of a site, the Developer, his agent or assign shall obtain all necessary City, County, State, and Federal permits for the construction of the project. The Engineer of Record shall submit copies of the approved permits to the Public Works Engineering Division prior to construction of road, bridge, utility and/or drainage facilities. In certain circumstances, conditional approval of the construction plans may be granted upon receipt of satisfactory evidence that applications for permit have been furnished to the City. This conditional approval shall be subject to the actual issuance of the required permit within ten working days from the date of conditional approval. Conditional approval may be rescinded at any time if City, County, State, and Federal permits have not been received. Conditional approval does not grant authorization to start construction unless specifically authorized in writing by the Director of Public Works.

(a) City of Lakeland Permits

The City of Lakeland issues Right-of-way Use Permits for driveway connections to City-maintained streets, utility installations, and other general uses of City-maintained right-of-way. Certain intended uses of City-maintained right-of-way may require City Commission approval of the installation prior to the issuance of a permit. Non-Utility Right-of-Way Use Permits specifically will be issued with time limitations clearly noted to minimize the impact to the public and business uses within the area.

(b) County, State and Federal Permits

Polk County and the Florida Department of Transportation issue permits for driveway connections to their roadways, utility installations and other general uses of rights-of-ways. Florida Department of Environmental Protection (FDEP) issues permits for construction activity in or affecting the water quality of waters of the State and potable water systems and wastewater systems. Southwest Florida Water Management District (SWFWMD) issues permits for stormwater management systems. The United States Environmental Protection Agency issues NPDES exemptions and permits for development, which require erosion control measures. Other permits may also be required by these or other agencies. All permits shall be on-site and available for inspection upon request.

1-28 CONSTRUCTION PLANS/PUBLIC AND PRIVATE STREETS

Construction plans and specifications prepared by and certified by a professional engineer licensed in the State of Florida must be submitted to the City of Lakeland Community Development Department for approval by the Department of Public Works and other departments for all proposed public and private street construction. These plans and specifications shall include the following minimum information:

(a) Topographic map of the site with elevations based on 1988 NAVD elevations, contour lines and other features that would influence the drainage pattern (existing or modified) of the site. Contours shall extend a minimum of 50 feet beyond the right-of-way or project limits, whichever is greater. A note shall be placed on the plans clearly specifying the horizontal and vertical datum used.

(b) A layout plan of the proposed development, showing all necessary existing and proposed elevations, grades and treatment of intersections.

(c) Typical roadway sections showing all necessary elevations, grades and intersection treatment including special profiles as needed to define design requirements of site specific locations. Refer to typical section details contained in this Manual.

(d) Drainage map, including the entire area to be developed and adjacent areas affecting or affected by the development. Refer to the requirements contained in Section 2 of this Manual.

(e) Plan and profile sheets for all public and private streets that are proposed for construction. These plans shall include existing topography and proposed elevations of roadway sections and method of connection to existing roads which may include special profiles of intersections.

(f) If variable width right-of-way is proposed, roadway and ditch cross sections shall be shown to describe site conditions. In any instance, the maximum interval of cross-sections shall be one hundred (100) feet.

(g) The construction plans shall include the location of all existing and proposed utilities and, where applicable, a utility relocation plan. Existing and proposed drainage facilities shall also be included in the plans. All afore-referenced facilities shall be located in plan and profile view and in most instances, be shown in cross-sectional views.

(h) Benchmarks shall be shown on the construction plans at an interval not to exceed five hundred (500) feet. These benchmark elevations are to be established on datum specified by the City Surveyor.

(i) Soil survey data indicating all soil classifications and seasonal high-water table elevations shall be provided. Soil classifications shall be in accordance with AASHTO soil classifications. Soil classifications shall be prepared and certified by a qualified engineer registered in the State of Florida.

(j) The construction plans shall also include the following requirements:

1. The location of all existing and proposed development lot lines; if applicable.

2. The location of and width of all utility and drainage easements. If easements are to accommodate both drainage and utilities, the utility/drainage easement shall be of sufficient width to provide separation of the facilities occupying the easement.
3. Title of the proposed subdivision or site development and address, where applicable.
4. Location and width of proposed outfall ditch easements or right-of-way, where applicable. This requirement shall include details of typical section and their relationship to cross-sections. Special details may be required that would provide adequate depiction of a proposed facility.
5. Identification of adjoining development including right-of-way, roadway widths, and names of roads impacted by the proposed development.
6. All plans shall contain a note, requiring conformance with the guidelines and criteria set forth in this Manual and with current FDOT Standard Specifications for Road and Bridge Construction Divisions II and III. Compliance with the guidelines and criteria set forth in other applicable manuals referenced in Section 2-3 of this Manual may be applicable. In every project, the plans and specifications shall conform to acceptable engineering practice. All engineering construction plans, specifications, and supplemental reports shall be prepared under the supervision of and shall be certified by an engineer registered in the State of Florida.

1-29 APPROVAL OF ENGINEERING PLANS

Prior to the start of construction, engineering plans must be approved in writing by the Director of Public Works. Prior to the Director of Public Works authorizing construction to begin, approval of electric utility work must be received from Lakeland Electric (LE) and for water/wastewater work from the Department of Water Utilities. Approval of such plans shall expire twelve (12) months after the date of original written approval by the City of Lakeland's authorized representative unless substantial construction has been achieved, or a Developer furnished construction schedule has been received prior, to extend the construction completion date. The determination of completion of substantial construction shall be made by the Department of Public Works prior to the expiration of the twelve (12) month approval period. If construction has not commenced within the initial twelve (12) month time period, the plans must be resubmitted and must comply with current criteria. After construction has commenced, work shall be continuous until complete. If the Developer suspends the construction for a period of six (6) months or more, plans shall be resubmitted and construction may not continue until the plans are reapproved.

1-30 INSPECTION OF PROJECT

The City shall inspect all permitted projects to assure the construction of infrastructure to be maintained by the City is in compliance with the approved plans. All developers/contractors are required to maintain a set of the City-approved plans and permits on-site at all times and available for City Inspectors upon request. When actual field conditions differ from those represented on the approved construction plans, the Engineer of Record shall notify the City so that a determination can be made if modifications to the plans are necessary. If substantial changes to the approved plans are required, the Engineer of Record shall submit revised plans reflecting the changes and receive approval of the modifications from the Department of Public Works before proceeding with work that deviates from the previously approved construction plans. Testing reports of each phase of construction shall be provided to the Public Works Inspector prior to proceeding to the next phase. The inspector may request tests, videos, or other documentation acceptable to Public Works to assure the constructed facilities are constructed in accordance with this manual. All pipes to be installed on City Property, right-of-way, or easements shall be videoed to assure the material is free of cracks or other damage. In addition, the Public Works Inspector may request additional tests in any locations where there is reasonable suspicion of improper workmanship.

1-31 ENFORCEMENT OF CODE VIOLATIONS

In the case where Lakeland City Codes, Land Development Regulations or Engineering Standards Manual is being violated, enforcement actions may be taken to bring the violation into compliance. Typically, the infraction shall be identified and the Contractor verbally notified and/or a written Notice of Deficiency provided. If the violation is significant or the infraction is not corrected in a “specified” amount of time after the Contractor has been notified of the violation, a Stop Work Order may be issued by the Director of Public Works.

1-32 CERTIFIED “AS-BUILT” CONSTRUCTION PLANS

“As-Built/Record Drawings” shall be provided for all roadway and drainage infrastructure upon completion of the project. The “As-Built/Record Drawing” shall show the original approved design as well as periodic as-built conditions and be certified by a Professional Engineer and a Professional Surveyor & Mapper based upon information provided by the Professional Surveyor & Mapper. Elevations shall be in North American Vertical Datum of 1988 (NAVD 1988) and must be documented on the As-Built/Record Drawings.

One (1) set of draft “As-Built/Record Drawings” shall be submitted to the City Inspector for review (22” x 34” or 11” x 17” are acceptable). Any additional information required by the City shall be marked on the review copy and returned to the Contractor by the City Inspector.

The Contractor shall gather the additional information and upon making any modifications shall submit one (1) set of pre-final certified "As-Built/Record Drawing" (22" x 34" or 11" x 17" are acceptable). Once the submittal is approved by the City Inspector, Contractor shall submit two (2) complete sets on electronic media in AutoCAD and PDF formats to the Department of Public Works. All final specifications, reports, and permits for the project should be included in this electronic submittal in Word, Excel, or PDF format. Latest versions of AutoCAD or other document types should be used.

Examples of the certifications required on the as-built drawings are as follows:

Professional Engineer: A copy of the certification is contained in the City of Lakeland "Engineering Standards Manual" Volume I, Section 3, Exhibits F and G.

Professional Surveyor and Mapper:

"I hereby certify the highlighted elevations and distances shown and added to these plans were made by me for a special purpose survey to provide as-built information according to the City of Lakeland requirements to provide an "As-Built/Record Drawing"."

The "As-Built/Record Drawings" shall as a minimum include elevations and dimensions for the following:

- A. Roadway centerline profile 100' maximum interval and wherever a profile adjusts or modifies.
- B. Roadway cross sections 100' maximum interval and wherever a profile adjusts or modifies.
- C. Elevations on all drainage structures, verifying all plan and typical dimensions. Inlets will typically include top and bottom elevations. Control structures shall include all dimensions including top, weir width, crest elevation, bottom elevation, orifice diameter, skimmer information, and any underdrain dimensions.
- D. Flow line on all pipes.
- E. Retention ponds both in plans and sections.
- F. Flow line elevation on all ditch breaks (vertical and horizontal).
- G. Additional elevations or dimensions as required by the Engineer of Record.

Specific information required for “As-Built/Record Drawings” for water and wastewater systems is included in Volume 3.

1-33 CITY’S ACCEPTANCE AND MAINTENANCE OF PUBLICLY DEDICATED FACILITIES

The City shall accept for maintenance only those streets, drainage systems and utilities (water and wastewater) that have been constructed within publicly dedicated right-of-way or easements, in accordance with the requirements of this Manual. The Developer may also demonstrate to the City that his development has complied with all permit conditions of the various regulatory agencies exercising jurisdiction over the development.

SUBDIVISION PLAT NOTES

Surveyor’s Statement:

Please include a statement on plat indicating, “**I have examined the construction plans for subject plat improvements and the dimensions of right of way, easements, retention ponds etc. are in compliance with improvements shown on plans.**”

_____ **Signature of Surveyor**

FOR ALL SUBDIVISIONS (PRIVATE OR PUBLIC ROADS):

- LANDS IN THE VICINITY OF A STORM WATER RETENTION/DETENTION POND, WATER BODIES, DITCH OR SWALE MAY BE SUBJECT TO TEMPORARY STANDING WATER WHEN CONDITIONS DECREASE THE RATE OF PERCOLATION AND PROPER DRAINAGE.
- THE HOME OWNERS ASSOCIATION SHALL BE RESPONSIBLE FOR THE OPERATION AND MAINTENANCE OF ALL RETENTION/DETENTION PONDS, DITCHES AND SWALES IN TRACTS OR EASEMENTS, WHICH ARE DEDICATED OR DEEDED TO THE HOMEOWNERS ASSOCIATION, AS SHOWN ON THIS PLAT; INCLUDING THE RECERTIFICATION OF ALL STORM WATER MANAGEMENT SYSTEMS TO THE WATER MANAGEMENT DISTRICT.
- IN THE EVENT A HOME OWNERS ASSOCIATION IS NOT YET CREATED AT THE TIME OF PLATTING, THE DEVELOPER SHALL BE RESPONSIBLE FOR THE OPERATION AND MAINTENANCE, INCLUDING RECERTIFICATION, OF ALL STORM WATER MANAGEMENT SYSTEMS, INCLUDING BUT NOT LIMITED TO PONDS, DITCHES AND SWALES LOCATED IN ROAD RIGHTS OF WAY AND

EASEMENTS THAT WILL BE DEDICATED OR DEEDED TO THE HOMEOWNERS ASSOCIATION ONCE IT IS CREATED, UNTIL SUCH TIME AS THE HOMEOWNERS ASSOCIATION IS CREATED AND THE DEDICATION TAKES EFFECT, OR UNTIL THE HOMEOWNERS ASSOCIATION IS CREATED AND THE STORMWATER MANAGEMENT SYSTEMS ARE PROPERLY DEEDED TO THE ASSOCIATION.

- NOTICE: THIS PLAT, AS RECORDED IN ITS GRAPHIC FORM, IS THE OFFICIAL DEPICTION OF THE SUBDIVIDED LANDS DESCRIBED HEREIN AND WILL IN NO CIRCUMSTANCES BE SUPPLANTED IN AUTHORITY BY ANY OTHER GRAPHIC OR DIGITAL FORM OF THE PLAT. THERE MAY BE ADDITIONAL RESTRICTIONS THAT ARE NOT RECORDED ON THIS PLAT THAT MAY BE FOUND IN THE PUBLIC RECORDS OF THIS COUNTY.

FOR SUBDIVISIONS WITH PUBLIC ROADS ONLY:

- FOR ROAD RIGHTS OF WAY OR DRAINAGE EASEMENTS DEDICATED TO THE PUBLIC OR THE CITY, LOT OWNERS SHALL BE RESPONSIBLE FOR MOWING THE VEGETATIVE AREAS INCLUDING BUT NOT LIMITED TO: DRAINAGE DITCHES, SWALES, OR DRAINAGE EASEMENTS. FOR ROAD RIGHTS OF WAY THAT THE CITY OWNS IN FEE SIMPLE, THE CITY WILL PERFORM ROUTINE MAINTENANCE, AS DEFINED IN SECTION 334.03(23), FLORIDA STATUTES ON ROADWAYS, DITCHES AND SWALES LOCATED IN ROAD RIGHTS OF WAY. FOR BOTH RIGHTS OF WAY OWNED IN FEE SIMPLE BY THE CITY AND RIGHTS OF WAY AND DRAINAGE EASEMENT DEDICATED TO THE CITY OR THE PUBLIC, THE LOT OWNER SHALL BE RESPONSIBLE FOR RETAINING THE DESIGN UNCHANGED. A LOT OWNER SHALL NOT EXCAVATE, OR PLACE FILL MATERIAL, LANDSCAPING, STRUCTURES OR BUILDINGS IN ANY ROAD RIGHTS OF WAY OR INTERFERE IN ANY WAY WITH DRAINAGE EASEMENTS WITHOUT PRIOR APPROVALS BY ALL AFFECTED AGENCIES. STREET TREES OWNED OR INSTALLED BY THE CITY MAY BE PRUNED WITH THE APPROVAL OF THE CITY ARBORIST.
- UPON SATISFACTORY FINAL INSPECTION OF ANY PUBLIC IMPROVEMENTS, ACCEPTANCE OF AS-BUILT PLANS, REQUIRED TESTS AND OTHER REQUIRED DOCUMENTATION, THE CITY SHALL ACCEPT RESPONSIBILITY FOR MAINTENANCE OF SUCH IMPROVEMENTS, PROVIDED THAT SUCH IMPROVEMENTS ARE ON LAND WHICH THE CITY OWNS OR FOR WHICH IT HAS ACCEPTED AN OFFER OF DEDICATION OR EASEMENT. SUCH ACCEPTANCE SHALL BE EVIDENCED BY A WRITTEN OR STAMPED ACCEPTANCE OF IMPROVEMENTS EXECUTED BY APPROPRIATE CITY DEPARTMENTS. UNLESS AND UNTIL THE CITY ACQUIRES SUCH

INTERESTS AND EVIDENCE OF ACCEPTANCE OF MAINTENANCE RESPONSIBILITY BY THE CITY IS PROVIDED, MAINTENANCE OF SUCH IMPROVEMENTS SHALL REMAIN THE SOLE RESPONSIBILITY OF THE APPLICANT FOR THE SUBDIVISION.

- MAINTENANCE OF ISLANDS INCLUDING LANDSCAPING AND IRRIGATION WITHIN ROADWAYS SHALL BE THE RESPONSIBILITY OF HOME OWNER'S ASSOCIATION.

FOR SUBDIVISIONS WITH PRIVATE ROADS/ ACCESS EASEMENTS:

- FOR ROAD RIGHTS OF WAY, ACCESS EASEMENTS OR DRAINAGE EASEMENTS DEDICATED TO THE PRIVATE ENTITY LIKE PROPERTY OWNERS ASSOCIATION OR THE DEVELOPER, PROPERTY OWNERS ASSOCIATION OR DEVELOPER SHALL BE RESPONSIBLE FOR MAINTAINING ROADWAYS, SIDEWALKS, MOWING THE VEGETATIVE AREAS INCLUDING BUT NOT LIMITED TO: DRAINAGE DITCHES, SWALES, OR DRAINAGE EASEMENTS. THE LOT OWNERS SHALL BE RESPONSIBLE FOR RETAINING THE DESIGN UNCHANGED. A LOT OWNER SHALL NOT EXCAVATE, OR PLACE FILL MATERIAL, LANDSCAPING, STRUCTURES OR BUILDINGS IN ANY ROAD RIGHTS OF WAY OR INTERFERE IN ANY WAY WITH DRAINAGE EASEMENTS WITHOUT PRIOR APPROVALS BY ALL AFFECTED AGENCIES.
- MAINTENANCE OF ISLANDS INCLUDING LANDSCAPING AND IRRIGATION WITHIN ROADWAYS SHALL BE THE RESPONSIBILITY OF HOME OWNER'S ASSOCIATION.
- ALL TRAFFIC SIGNS, PAVEMENT MARKINGS ON PRIVATE ROADWAYS/ COMMON AREAS ARE TO BE MAINTAINED BY PROPERTY OWNER/HOME OWNERS ASSOCIATION PER (MUTCD) MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

FOR ALL SUBDIVISIONS:

- **FLOOD HAZARD WARNING**

THIS PROPERTY MAY BE SUBJECT TO FLOODING. EVEN MEETING FEDERAL, STATE OR LOCAL STANDARDS DOES NOT ENSURE THAT ANY IMPROVEMENTS SUCH AS STRUCTURES, DRIVEWAYS, YARDS, SANITARY SEWAGE SYSTEMS, AND WATER SYSTEMS WILL NOT BE FLOODED IN CERTAIN RAIN EVENTS.

1-34 WARRANTY PERIOD FOR CITY- MAINTAINED IMPROVEMENTS

The duration of the maintenance guarantee is a minimum of one (1) year from the date of acceptance of the maintenance guarantee, and issuance to the Developer a letter advising that the warranty period has started. In certain situations, where

the City has concerns with respect to the anticipated performance of a publicly dedicated facility due to unusual soil conditions, high groundwater, poor workmanship, etc.; the Director of Public Works may choose to extend the duration of the maintenance guarantee.

1-35 INSURANCE REQUIREMENTS

The City of Lakeland shall require that insurance be provided to the City for contracts, leases, use agreements, and for certain permitted activities, etc. The insurance provisions shall be determined by the extent of exposure presented in a specific activity. The City's Office of Risk Management shall establish the necessary insurance requirements for specific exposures. Proof of required insurance coverage shall be furnished to the City prior to the City authorizing such an activity requiring insurance coverage.

1-36 SITE PLAN REQUIREMENTS

The alteration of land, development, redevelopment of a multi-family, commercial, or industrial project sites may require that site plans be submitted to the City for the review and approval by the various City Departments. The guidelines for the site plan submittal are outlined in the "Commercial Site Plan Preparation Guide" available on Community Development's web site:

<http://www.lakelandgov.net/commdev/CommunityDevelopment/DevelopmentReview/SitePlanReview.aspx>

1-37 ROADWAY AND SITE DEVELOPMENT PROJECT OUTLINE

The following is information intended to assist Developers through the phases of a routine project. The Project Development Phase Outline (1-37.1) includes information required by the participants to complete a typical project. Checklist for Subdivision Construction (1-37.2) is provided to assist applicants to develop a subdivision. The outline is not intended to be considered a mandatory policy but it does indicate the sequence of certain basic activities of a project and the entity normally responsible for initiating or performing the specified activity or event.

Attention is drawn to Section 2-5 "Design High Water" and Section 2-6 "Culvert Design" to assist with subdivision finished floor elevations and roadway elevations. Multiple criteria must be met before a development can be approved for construction in the City and these criteria are established to provide minimum standards.

All construction plans for public or private streets and all site development plans shall conform to the criteria set forth in Section 1-28. All public and private roadways and subdivisions plans shall provide the minimum information listed in Section 1-37.2. Certain street related and site development related projects will require permits from other governmental regulatory agencies not specifically

identified in Section 1-27. The Developer must be aware that these outlines and guides are not totally comprehensive and any omission of a specific permit requirement in these guides shall not relieve Developer of the responsibility of compliance with other requirements not specifically identified.

1-37.1 Project Development Phase Outline

CONSTRUCTION PHASE				
	CITY	DEV	ENG	CONT
A. On-site inspection of materials to be used in the construction of Facilities to be maintained by City.	X			
B. Project construction – on site – give City minimum of 48-hours’ notice prior to commencement.			X	X
C. Project construction – off site – give City minimum of 48-hours’ notice prior to commencement.			X	X
D. Construction inspection periodic, as required.	X		X	
E. Submit all required test results to City.			X	
F. System cleaning testing, etc.				X
G. Collect as-built data to confirm plans.			X	X
POST CONSTRUCTION PHASE				
	CITY	DEV	ENG	CONT
A. City’s final inspection and review with engineer or contractor.	X		X	X
B. Submit “As-Built/Record Drawings” to City.			X	
C. Submit “As-Built/Record Drawings” to SWFWMD, FDEP, etc.			X	
D. Prepare utility easement and submit to City.			X	
E. Submit Certification of Dedication of right-of-way or easement or request plat be released for recording, when applicable.		X		
F. Letter to developer accepting project.	X			
G. Commencement of one year project warranty – as indicated in acceptance letter.		X		X
H. Authorize Certificate of Occupancy for buildings	X			

1-37.2 CHECKLIST FOR SUBDIVISION CONSTRUCTION

			A. <u>Preliminary Construction Plan</u>
<u>Yes</u>	<u>No</u>	<u>N/A</u>	
___	___	___	1. One (1) set of construction plans signed & sealed by Florida Registered Engineer.
___	___	___	2. Plan Size: (a) Size – 22" x 34" or 11" x 17" acceptable. (b) Scale – Plan view 1" = 40' Typical and cross sections Hor. 1" =20' Min.; Vert. 1" =5' Min.
___	___	___	3. Name of Subdivision (or Development).
___	___	___	4. Name, address & telephone number of: (a) Developer or Owner (b) Engineer (c) Surveyor
___	___	___	5. Legend: (a) Date (b) North arrow & scale
___	___	___	6. Location Map.
___	___	___	7. Legal description with acreage.
___	___	___	8. Existing streets, driveways, sidewalks, platted right-of-way and any public or private easement within and adjacent to the subdivision or development.
___	___	___	9. Existing water, sewer, storm or any other utility within and adjacent to the development.
___	___	___	10. Existing buildings and structures within or adjacent to the development.
___	___	___	11. Existing contours at a maximum one (1) foot intervals, based on 1988 NAVD Datum with location of Bench Marks shown and the datum used clearly labeled.
___	___	___	12. Location of any on-site natural features including trees, water courses, ditches, lakes, marshes, swamps, wetlands and other sensitive areas. D.E.R., C.O.E., and/or SWFWMD jurisdictional boundaries and acreage to be designated, if applicable.
___	___	___	13. Proposed typical sections of roadways, swales, ditches, etc.
___	___	___	14. Horizontal alignment with dimensions of all streets, alleys, easements, Public lands and utility layouts (electric, water, sewer, storm, etc.) showing connections to existing systems and proposed lot service.
___	___	___	15. Lot lines with dimensions.
___	___	___	16. Proposed grades and grading including paving, drainage and utilities.

B. Final Construction Plan (All info above plus):

___	___	___	17. One (1) hard copy and electronic copies (PDF and AutoCAD) of plans prepared and sealed by a Registered Engineer which include the following:
___	___	___	18. Certified survey signed and sealed by a licensed surveyor.
___	___	___	19. Proposed roadway pavement structural design.
___	___	___	20. Existing and proposed profile grades of all streets, storm

- drainage, water, sewer, etc. Ditch and swale flow lines, if applicable. Indicate discretion of flows with arrows.
21. Soil profiles to six feet per AASHTO including water table elevations. In number to be sufficient for design purposes and satisfactory to Department of Public Works. Typically, a minimum of 1 boring every 200 feet down the centerline of future roadway construction. Where roadway construction is to occur in previously mined areas or low areas which have been previously filled borings to at least 20 feet in depth and a geotechnical report included and signed and sealed by a registered engineer stating the suitability of the soils to support the type of development proposed. If unsuitable materials are discovered, they shall be identified and removed. If removal is not feasible, alternative designs by a geotechnical engineer will be considered.
22. Permits – Developer shall obtain all required permits prior to construction, as required, from the jurisdiction:
- (a) COE
 - (b) FDEP
 - (c) FDOT
 - (d) SWFWMD application, permit, and drainage calculations.
 - (e) Polk County
 - (f) City of Lakeland
 - (g) NPDES
23. An FDOT Maintenance of Traffic plan per F.D.O.T. “Roadway and Traffic Standards” and Indexes for all proposed street closures, detours and work within the right-of-way by a certified engineer has been included in the plans.
24. Proposed erosion and sediment control plan and evidence that a NPDES notification has been prepared for submittal to FDEP for projects over 1 acre.
25. FEMA map information indicating flood zone information. Flood zone must be labeled on construction plans. For lands to be developed in Flood Zones other than Zone X the following shall be included:
- (a) Flood compensation calculations provided showing the volume between SHWT and the 100-year flood is maintained where dredging and filling is proposed.
 - (b) Minimum proposed floor elevations are 1 foot above the 100 year flood.
 - (c) Any fill to be placed within the 100-year flood plain shall be compacted according to FEMA requirements to prevent settlement below the 100-year flood and an engineer shall certify that all FEMA requirements have been met.
26. All intersections comply with the local standards for offset alignment according to Figure 37.03 in Article 37 of the LDR Subdivision Regulations. Any intersections shall either line up with any streets on the opposite side of the street or be offset by 125 feet or more.
27. Certification note on the plans indicating the design engineer has designed the improvements and features of the subdivision in compliance with the FDOT “Manual of Uniform Minimum Standards for Design, Construction, and Maintenance for Streets and Highways” current edition (Green Book).
28. Certification note on the plans indicating the Engineer of Record

will inspect the materials and workmanship to assure it is in compliance with this Manual and the “**FDOT Standard Specifications for Road and Bridge Construction**”.

- | | | | | |
|-----|-----|-----|-----|--|
| ___ | ___ | ___ | 29. | Proposed building uses, setbacks, heights, number of stories and ground floor elevations. |
| ___ | ___ | ___ | 30. | Proposed land use areas i.e.: buildings, pavement, retention ponds, green or open areas, etc. Including unit types and planned use of buildings. |
| ___ | ___ | ___ | 31. | Proposed landscaping plan |
| ___ | ___ | ___ | 32. | Phasing, if applicable. |
| ___ | ___ | ___ | 33. | Identify refuse storage size & location. Contact Solid Waste Mgmt. @ (863) 834-8778 for access design. (See Index 800). |
| ___ | ___ | ___ | 34. | Required parking with number required and available, including handicap. |
| ___ | ___ | ___ | 35. | Horizontal alignment with dimensions of all streets, alleys, easements, public lands and utility layouts (water, sewer, storm, etc.) showing connections to existing system. |
| ___ | ___ | ___ | 36. | Proposed grades on site and as necessary off-site grades to show impact of grading and drainage to adjacent properties. |
| ___ | ___ | ___ | 37. | Surface drainage of site, including flow arrows. |
| ___ | ___ | ___ | 38. | All signs & exterior lighting facilities (See Sign Ord.). |
| ___ | ___ | ___ | 39. | All existing & required buffer fences (See Zoning Ord.). |
| ___ | ___ | ___ | 40. | Proposed sidewalks and aprons. |
| ___ | ___ | ___ | 41. | Proposed erosion and sediment control plan. |
| ___ | ___ | ___ | 42. | A proposed Maintenance of Traffic plan per FDOT “Roadway and Traffic Standards” and Indexes for all proposed street closures, detours and work within the right-of-way by a certified engineer has been included in the plans. |
| ___ | ___ | ___ | 43. | Copy of notification letter to FDOT for review of proposed work involving their right-of-way. |

NOTE: Construction shall not begin prior to the approval by the City. And receipt of any required permits from the other governing agencies.

Project Name _____

Date Approved _____

Date Rejected _____

Reviewed By _____

Revision Dates:

- 9/13/01
- 4/9/03
- 8/29/03
- 6/29/12
- 3/8/2013
- 1/3/2014
- 10/2/2017
- 9/15/2018

1-38 ROADWAY RESURFACING

Resurfacing shall be in full compliance with the latest FDOT Standard Specifications and Americans with Disabilities Act (ADA) standards. The standard resurfacing treatment shall be to mill 1 to 1.5 inches of asphalt and resurface with 1 to 1.5 inches of asphalt in accordance with Section 1-10 of this Manual.

The minimum requirements below are intended to preserve the integrity of the City's roadways while allowing staff flexibility in selecting pavement maintenance treatments. Deviations from the policy below may be approved by the Public Works Director.

(a) Resurfacing Curbed Roadways

Roads shall have a minimum curb reveal of four (4) inches. Roads that do not meet this criteria shall be milled and resurfaced to meet the criteria as part of the pavement maintenance operation, unless pavement cores show that sufficient asphalt thickness does not exist. If sufficient asphalt thickness does not exist, the pavement shall be milled to the extent practical to maximize curb reveal while providing adequate structural number. If roadway pavement is one inch or greater above adjacent Miami curb then the road must be conventionally milled and resurfaced as the next maintenance treatment.

(b) Resurfacing Uncurbed Roadways

It is important for the roadway surface to line up with existing driveways. In order to prevent roadway surfaces from rising an excessive amount above existing driveways, any roadway that has received one inch or more of asphalt overlay or other maintenance strategies without milling shall be milled and resurfaced with superpave asphalt to the original pavement grade as the next pavement maintenance operation.

SECTION 2. DRAINAGE ENGINEERING REQUIREMENTS FOR PROJECT DEVELOPMENT

2-1 GENERAL

Policy Statement

The design of drainage and stormwater management systems shall be in accordance with the FDOT manuals, handbooks and standards referenced in Section 1-3 of this Manual.

The design of the drainage and stormwater management facilities shall comply with the standards in the FDOT [Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways \(Florida Greenbook\)](#) and the rules of the Southwest Florida Water Management District (SWFWMD), the Florida Department of Environmental Protection (FDEP) and any other statutory regulations that may affect the design of such facilities. Where a conflict occurs, the more stringent provision shall apply. When proposed facilities drain to the City's existing drainage system the Public Works Department may impose additional requirements. Additional requirements will typically consist of taking steps to prevent increased flooding of adjacent properties, prevent increases of the post development discharge, and proper sizing of systems to handle offsite runoff that drains through the property. Where the Developer desires to increase the discharge from an existing or proposed site and the City system is at capacity, consideration may be given to allow the Developer to increase the capacity of the City system if the Developer obtains the appropriate permits from the SWFWMD and other regulatory agencies.

Polluted stormwater runoff is commonly transported through Municipal Separate Storm Sewer Systems (MS4s), from which it is often discharged untreated into local water bodies. As a result of the EPA regulations, the City was required to obtain an MS4 permit with requirements to regulate stormwater quality within the City Limits. Therefore, no discharges are allowed to the MS4 except for stormwater. Floor drains from buildings, car wash facilities, dumpster pad drains, and other types of facilities that discharge anything other than stormwater to the MS4 are prohibited. Groundwater is not inherently considered stormwater but dewatering may be allowed on a case by case basis providing it is not contaminated and proper state and local permits are obtained. The City reserves the right to request tests be made by the entity performing the dewatering activity on the groundwater prior to obtaining approval to discharge to the MS4. Groundwater exceeding certain limits of pollutants which would result in a violation of the City's MS4 permit, will not allowed to drain to the MS4.

2-2 DRAINAGE MAP

The Engineer of Record shall include in the Drainage Calculations a Master Drainage Map showing all existing and proposed features. The map is to be prepared on a scale not to exceed 1" = 200'. Listed below are the features that are to be included on the drainage map.

(a) Drainage Basin Delineation

1. All areas draining to the proposed project.
2. All areas tributary to existing structures.
3. All areas tributary to proposed structures.
4. All basin boundaries shall be well defined on the drainage map.

(b) One (1) foot contours within the boundaries of the project and at least fifty feet (50') beyond the property boundaries on all sides.

(c) High water data on existing standing water, areas of heavy seepage, or springs within the boundaries of the proposed subdivision.

(d) Existing seasonal high groundwater elevations.

(e) Existing drainage features (ditches, roadways, ponds, etc.).

(f) Proposed subdivision and/or project layout with horizontal and vertical controls.

2-3 SITE GRADING PLAN AND THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

The construction plans shall include a site-grading plan for all development sites. The City has adopted a Flood Damage Protection Ordinance (Ordinance 5610) which complies with the regulations of the National Flood Insurance Program (NFIP) and the Federal Emergency Management Agency (FEMA). Therefore, it is essential that the Engineer of Record be aware of and comply with the requirements of the City's Flood Damage Protection Ordinance.

Areas of special flood hazard have been identified by the Federal Emergency Management Agency (FEMA) in its latest Flood Insurance Rate Map (FIRM), along with accompanying maps and other supporting data and any revision thereto. The Engineer of Record is responsible for providing pertinent information relating to the base flood elevation data on the site grading plan and for providing minimum floor elevations for proposed buildings in the various floor hazard zones identified in the FIRM. The Engineer of Record shall provide a copy of the portion of the FIRM with the project plotted correctly to identify projects in areas subject to the 100-year flood and provide reasonable assurance all structures are properly protected from the base flood. When the project is in an area subject to flooding from the 100-

year flood, the Engineer of Record shall submit documentation that any fill placed in the 100-year flood plain shall be compensated for to prevent any increase in the 100-year flood elevation. In addition, the Engineer of Record providing services to modify any current FEMA FIRM's shall comply with all required City and FEMA requirements including but not limited to the following:

1. Providing assurance that any fill placed in the 100-year flood zone has been placed in compliance with FEMA requirements.
2. That any site designed as a subdivision or building lot and lower than the Base Flood Elevation (BFE) will either be elevated and/or flood proofed.
3. Any time a floodplain is altered a flood map amendment shall be made by the developer through FEMA.

2-4 DESIGN CRITERIA

The design of drainage and stormwater management systems shall be in accordance with the FDOT [Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways \(Florida Greenbook\)](#) Chapter 20 and with the manuals, handbooks and standards referenced in Section 1-3 of this Manual.

Since most areas of the City may have little or no excess capacity in the existing storm drainage systems, the City reserves the right to require that proposed development shall not increase the discharge rate or increase the volume of runoff to those systems as a result of development. Under certain conditions, even though the SWFWMD may exempt a project, the City may require a pre-post-match of drainage discharge from a site for a 25-year and 24-hour or other frequency storm regardless of the size of the project, especially in areas where flooding has been documented. When a Developer elects not to maintain the pre-post-match for water quantity/quality discharge, the Developer may be required to make improvements to the City system to accommodate the increased discharge. A SWFWMD Environmental Resource Permit or Exemption is required for all proposed developments. When the Developer is exempt from SWFWMD requirements, and wishes to increase runoff from a proposed site, the Engineer shall analyze the existing drainage system and submit computations to the City demonstrating the design will not adversely impact the existing drainage system.

Proof of a SWFWMD permit or exemption shall be sufficient evidence that stormwater treatment and attenuation are adequately addressed. However, a proposed storm drain system will still be required to be in full compliance with the City's Engineering Standards Manual. If a project requires an FDOT Drainage Connection Permit and no stormwater runoff discharges to the City stormwater system are proposed, then proof of an FDOT approved permit shall suffice providing drainage calculations are included with the permit.

Bridges and major crossings shall use hydraulic computations that are accepted by FEMA and Federal Agencies that will not alter the 100-year flood elevation as required in FEMA publications. The SCS method shall be used for retention and detention facilities using the design frequency listed below. Rainfall data and design frequency of rainfall events for storm sewer designs shall be developed using the Rational Formula or SCS method and are to be obtained using the FDOT Zone 8 Rainfall Curves, as provided in the FDOT Drainage Manual (Refer to following table for design frequency criteria). The City in special circumstances may request the Developer to reduce the rate of discharge below the allowable rate under special circumstances such as severe downstream flooding.

Pipe culvert lengths, minimum cover and clearances, open channels, and design maximum/minimum velocities shall comply with the FDOT [Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways \(Florida Greenbook\)](#) Chapter 20. Polypropylene pipe (PP) may be used in the City in certain locations where the type of existing ground material is suitable but must be approved in writing by the Director of Public Works. Buoyancy calculations must be submitted and approved for this type of pipe to be used and cover requirements must be twenty-four (24) inches or the diameter of the pipe whichever is greater. All storm drain pipe must be tv'ed and profiled prior to asphalt being placed in the street. This requirement applies to public and private systems since the City must abide by National Pollutant Discharge Elimination System (NPDES) permitting and requirements for all discharge systems.

2-5 DESIGN HIGH WATER

The establishment of roadway elevations will be governed by the seasonal high water (SHW) or the design high water (DHW), whichever is greater. The SHW or DHW provides an elevation for determining a roadway base clearance that will adequately protect the base from saturation. The following minimum roadway base clearances are standard values for those base materials that are susceptible to structural deterioration due to their proximity to standing water and those that are more tolerant to this condition.

The bottom of water susceptible base shall be no lower than two (2.0) feet above the SHW, while non-water susceptible base shall be no lower than one (1.0) foot above the SHW.

The Roadway Profile Grade Line (PGL) shall be a minimum of one (1.0) foot above twenty-five (25) year and twenty-four (24) hour DHW elevations adjacent to the roadway.

Where high ground water levels exist, provisions acceptable to the Director of Public Works shall be made to protect the proposed roadway base.

In order to meet the above groundwater clearances, the design of an under-drain system will be considered.

After the City's acceptance of a roadway, the City will monitor the project to verify required grade relationships with design high waters (DHW) have been met. If this DHW fails to meet the required clearances for the base course, the City will require the Developer or Owner to install an underdrain system, in order to bring the project into compliance with the DHW criteria.

Base floor elevations shall be a minimum of two (2) feet above the one hundred-year (100) year flood stage in accordance with Ordinance 5615. In addition, base floor elevations within a basin without an overflow outlet shall be a minimum of two and one half (2.5) feet above the one hundred (100) year flood stage. Building pad elevations shall also be a minimum of one (1) foot above the centerline of road or curb line (whichever is higher) in new subdivisions or reconstruction. City Ordinances may be more stringent than these requirements and would overrule this manual.

2-6 CULVERT DESIGN

All culverts under pavement shall be reinforced concrete pipe (RCP) or polypropylene pipe (PP) if criteria are met noted below. High density polyethylene pipe may not be used under pavement and requires the Public Works Director's written approval and will be handled on a case-by-case basis. Other pipe materials may be considered when located outside of the Control Line as defined in Index 500. Other pipe materials must be in conformance with FDOT Optional Pipe Materials requirements. A culvert service life estimator analysis, signed and sealed by a licensed professional engineer, showing at least one hundred (100) years of design service life must be provided if a pipe material other than concrete or polyethylene is used. Buoyancy calculations must be provided for all non-concrete storm sewer pipes. Corrugated metal pipe and single-wall polyethylene pipe are not permitted under any circumstances in the public right-of-way. The Public Works Director must approve in writing the use of optional materials prior to construction.

Minimum culvert size for cross drains, storm sewers and site drains shall be eighteen (18) inches or equivalent. The Public Works Director must approve in writing the use of storm sewer less than the minimum noted.

Culverts or pipes used on certain commercial or private projects that are less than eighteen (18) inches in diameter may use PVC or cast iron but will only be approved on a case by case basis and must use flowable backfill (FDOT Drainage Manual minimum requirements) around and over the pipe.

Minimum culvert size for cross drains, storm sewers and site drains shall be eighteen (18) inches or equivalent. The Public Works Director must approve in writing the use of storm sewer less than the minimum noted.

2-7 UNUSED

2-8 UNUSED

2-9 END TREATMENTS

Endwalls or mitered ends shall be installed on all culverts unless other provisions are made for erosion protection. Endwalls and mitered ends shall conform to the FDOT Design Standards, and the FDOT Standard Specifications for Road and Bridge Construction.

2-10 UNUSED

2-11 CONFLICT MANHOLES

(a) Where it is necessary to allow a sanitary line or other utility to pass through a manhole, inlet, or junction box because of no reasonable alternative, the utility pipe shall be ductile iron. The utility pipe shall be located in the upper half of the storm sewer opening, provided it is determined that the hydraulics of the storm sewer will not be adversely affected.

(b) A minimum of one (1.0) foot vertical clearance shall be provided between the outside shell of the utility pipe and the invert of the storm manhole.

(c) A minimum of two (2.0) feet of horizontal clearance shall be provided on at least one side of the utility pipe within the conflict structure for maintenance purposes.

2-12 DRAINAGE AND STORM SEWER SYSTEMS

General

Storm drain designs shall be completed in accordance with the FDOT Drainage Manual and FDOT Storm Drain Handbook. All storm drains under pavement shall be reinforced concrete (RCP) or polypropylene pipe (PP) when appropriate cover is provided as noted previously and approved in writing by the Director of Public Works. Other pipe materials may be considered when located outside of the Control Line as defined in Index 500. Other pipe materials must be in conformance with FDOT Optional Pipe Materials. A culvert service life estimator analysis, signed and sealed by a licensed professional engineer, showing at least one hundred (100) years of design service life must be provided if a pipe material other than concrete or polyethylene is used. Buoyancy calculations must be provided for all non-concrete storm sewer pipes. Corrugated metal pipe and single-wall polyethylene pipe are not permitted without written authorization of the Director of Public Works within the public right-of-way and only in special circumstances.

In all instances, the drainage design calculations shall be submitted along with the engineering plans.

When curb inlets are necessary, Types 1, 2, 3, and 4 are preferred. Types 5 and 6 may be approved by the Director of Public Works when appropriate justification is provided.

2-13 UNUSED

2-14 DRAINAGE EASEMENTS OR RIGHT-OF-WAY

Drainage easements in addition to the right-of-way width shall be sufficient to accommodate all portions of the public drainage system and to provide access for the facility maintenance. Such easement shall be dedicated to the City of Lakeland or to a recognized entity that shall be responsible for the maintenance of the easement. Where drainage facilities serve private streets, the easement or designated area reserved for drainage facilities shall be sufficient in width to accommodate all portions of the drainage facility and to provide for access to maintain the facility. Such easements shall be dedicated to a responsible private maintenance entity. No permanent structures shall be constructed within the drainage easements that would interfere with the operation and maintenance of drainage facilities.

For urban design storm sewer system not within street right-of-way, the drainage easement shall be sufficient to accommodate a ten (10) foot wide flat working area and a work trench with 1:1 side slopes and with a bottom width of two (2) feet wider than the storm sewer width. In no case shall a drainage easement or right-of-way not contiguous to a street right-of-way width be less than twenty (20) feet.

Rural design drainage or swale systems shall have sufficient width of right-of-way or easement to include all elements of the ditch or swale system.

Outfall ditches not adjacent to a roadway shall be situated within a drainage easement of sufficient width to allow a minimum of fifteen (15) foot wide maintenance berm on one side and a five (5) foot wide stability berm on the opposite side of the ditch, in addition to the width required to encompass all elements of the ditch.

2-15 STORMWATER MANAGEMENT SYSTEMS

Design

Retention and detention can be incorporated separately or together in storage facility designs as site conditions and management objectives require. The development of retention/detention facilities and system design calculations for the

proposed method of treatment and attenuation shall be submitted along with construction plans.

The design and operation of retention and detention facilities shall be in accordance with the criteria set forth in the Florida Administration Code and Rules of the Southwest Florida Water Management District. Permits shall be received from the appropriate jurisdiction (Florida Department of Environmental Protection and/or Southwest Florida Water Management District) prior to construction of the proposed project, although conditional approval of the design concept may be granted subject to the conditions stated in this Manual. If permit application is rejected by the governing regulatory agency, then conditional approval granted by the City shall be rescinded. Conditional design approval shall not authorize construction of the drainage facility to commence. The City will not accept the maintenance of drainage systems that require operation of pumps.

Easements or Right-of-Way

Facilities to be maintained by the City shall include sufficient right-of-way or easement to allow for installation of the stormwater management system plus an unobstructed twenty (20.0) foot wide maintenance berm around the perimeter of the stormwater management system unless otherwise approved by the Director of Public Works. The twenty (20.0) foot width is measured from the top of the bank. However, a stormwater management facility with side slopes of 6:1 or flatter may have a maintenance berm ten (10.0) feet in width. An access right-of-way or easement twenty (20.0) feet in width shall be provided from the public or private street right-of-way to the stormwater management system, wherever needed for ingress and egress. In the case where a stormwater management system serves subdivision streets, or public streets, an easement shall be dedicated to the public, with the provision on the plat or deeds that the maintenance of the stormwater management system will be the responsibility of legally recognized private entities. This may include individual lot owners, homeowner's associations (HOAs), property owner associations, or any entity acceptable to the Southwest Florida Water Management District (SWFMD). In the case of the stormwater management system serving a private street, the easement or right-of-way shall be dedicated or reserved to a specified private entity that shall be responsible for all aspects of its maintenance.

Stormwater Inflow and Discharge

Areas adjacent to the retention/detention basin shall be graded away from the basin to preclude the entrance of off-site or excessive stormwater runoff. Runoff inflow and discharge shall be by pipe culvert, flume, spreader swale, or other permanent structure and whenever possible be connected to the nearest existing storm sewer. Discharge structure geometry and location shall be designed to minimize impacts to adjacent property. If the existing City system is over capacity, a reasonable attempt shall be made to reduce the post development discharge

rate to minimize impacts to downstream properties. Project sites with an increase in new impervious area and exempt from Southwest Florida Water Management District (SWFMD) may be required to provide a stormwater management plan to the City.

Maximum Side Slope

The maximum side slope for retention/detention basins shall be in accordance with the current rules of the Southwest Florida Water Management District (SWFMD), Chapter 40D, Florida Administrative Code. The use of walls to allow retention/detention above ground is prohibited. Fencing of a stormwater management system may be required, where, in the opinion of the Director of Public Works, the combination of depth, location and grade of side slopes of the detention/retention area are a safety hazard and warrants such treatment. The maintenance of said fencing shall be the responsibility of specified private entities.

Minimum Freeboard

The minimum freeboard for 25-year design frequency basins shall be one (1.0) foot between twenty-five (25) year twenty-four (24) hour design high water and top of bank. The minimum freeboard may be reduced to 6 inches if the stormwater management facility is completely surrounded by a permanent concrete border or if the contributing area is less than two (2) acres.

Provisions shall be included to safely discharge storms in excess of the twenty-five (25) year storm to prevent bank overtopping and berm failure. The one hundred (100) year twenty-four (24) hour peak stage for all ponds shall be below the top of berm elevation. Provisions shall be included to safely discharge storms in excess of a one hundred (100) year event to prevent bank overtopping and berm failure.

Seeding and Mulching

The pond right-of-way shall be seeded and mulched or sodded, as specified. All side slopes on all basins shall be sodded. The bottom of the ponds will not require vegetation but may be vegetated if approved by the Engineer of Record.

Control Structures

Control Structures for stormwater management ponds shall be constructed as a modified Ditch Bottom Inlet in accordance with FDOT Index 232. Skimmers shall be constructed of fiberglass with a minimum thickness of ¼ inch and in compliance with FDOT Index 240.

2-16 UNDERDRAIN SYSTEMS

Soil borings shall be made and analyzed to determine the soil conditions and seasonal high groundwater levels in the design area.

Underdrains may be required when the highest groundwater is found to be at a depth less than two (2) feet below the bottom of the base course but only with soil conditions that support the underdrain use. Development roads may be required to be raised if underdrains cannot be used due to high clay or silt content in soils.

Underdrains shall be constructed in accordance with FDOT Design Standards Index 286 and the FDOT Standard Specifications for Road and Bridge Construction. They shall be placed on the uphill side of the roadway (or on both sides, where needed) with the crown of the underdrain pipe as shown in Index 286.

The underdrain systems shall be shown on the engineering plans, along with the pipe sizes, flow lines, cleanouts, outfall location, and materials specifications.

Underdrains may only be used with written approval from the Director of Public Works and with the appropriate supporting documentation noted above.

2-17 UTILITIES CROSSING DRAINAGE DITCHES

Where it is necessary for a utility to cross a drainage ditch, the following minimum requirements shall be adhered to:

- (a) Aerial Crossing: In the case of aerial facilities such as power, television, or telephone, a minimum vertical clearance of twenty (20) feet is required to facilitate maintenance activities of the ditch. Piped utilities shall be installed underground when possible. However, a minimum 2.0' clearance for pipes and rigid conduits above one hundred (100) year flood design high water shall be required when above-ground crossings are proposed and approved by the Director of Public Works.
- (b) Underground: Minimum of thirty-six (36) inches of cover over the top of the crossing pipe or be adequately protected by a method approved by the Department of Public Works.
- (c) Utilities shall be adequately identified by marker tape, tracer wire, or other suitable material to facilitate utility locates during construction or maintenance operations.
- (d) No aerial supports shall be allowed in the confines of the ditch cut, unless authorized by the Director of Public Works.
- (e) All sleeves for crossings shall be ductile iron, steel, or other material approved by the Director of Public Works.

2-18 DRIVEWAY AND SIDEWALK REQUIREMENTS AT DITCH AND SWALE CROSSINGS

Placement

In those instances where a driveway and/or sidewalk must span a ditch, the Developer must furnish and install a side drain pipe which conforms to the requirements of this Section and is approved by the Public Works Department. Where a driveway must span a swale, the Developer must provide a paved driveway with either a side drain pipe or swale crossing that does not impede the drainage function of the swale. Refer to City of Lakeland Standard Detail 515 in Section 3 of this manual and FDOT Index 515 for minimum requirements.

Material Specifications

The installation and material specifications for side drain pipes, shall be in compliance with the requirements of this section, and in accordance with the requirements set forth in the FDOT Standard Specifications for Road and Bridge Construction.

Inverts

The side drain pipe invert elevations shall be no greater than 0.2 foot below the ditch bottom profile grade. Paved driveways across swale section shall match the design grade of the swale section and shall not impede drainage design flow, except as approved or as designated by the Department of Public Works.

Pipe Sizes

Pipe sizes shall be in accordance with the particular site-specific requirements of the project. The minimum side drain pipe culvert shall be eighteen (18) inch diameter or equivalent.

Mitered End Sections

At each end, side drains shall have a mitered end section constructed in accordance with the FDOT Design Standards.

SECTION 3. TRAFFIC ENGINEERING REQUIREMENTS

3-1 TRAFFIC CONTROL DEVICES

All traffic control devices including those signs and pavement markings on public and/or on private property when the public is invited must conform to standards adopted by the Florida Department of Transportation pursuant to Florida Statute, Section 316.0747.

The “Manual on Uniform Traffic Control Devices” (MUTCD) published by the U.S. Department of Transportation is the national standard for Traffic Control Devices. The Florida Department of Transportation has adopted the MUTCD as the State standard by Rule 14-15.10.

The City of Lakeland has adopted Section 316 of the Florida Statutes, the Florida Uniform Traffic Control Law, relating to the use and regulations of streets and highways within the territorial limits of the City of Lakeland, Florida (Ord. No. 1791).

All equipment cut sheets MUST be approved by the City of Lakeland Traffic Operations.

(a) Signalization

During the review of the development plan, the Department of Public Works Traffic Operations Division will review the need for signalization. The Developer shall be responsible for submitting any traffic studies required to determine signalization requirements, or requests for additional traffic controls. This determination will be based upon traffic warrants as identified in the Manual of Uniform Traffic Control Devices.

(b) Costs

All costs for the design and installation of required traffic control devices and street name signage's including but not limited to design, permitting, construction and installation of signalization shall be borne by the Developer.

(c) Temporary Road Closures

The temporary closure of public streets located within the City of Lakeland for the purposes of a special event, roadway or utility construction, reconstruction, maintenance, or emergency purposes may be authorized through the issuance of a Permit by the Department of Public Works. An additional permit shall be obtained from the appropriate agency for those roads within the City of Lakeland maintained by Polk County or the Florida Department of Transportation.

(d) Street Name Signs

Streets shall be named in accordance with the Land Development Code.

(e) Traffic Control and Work Safety

Construction, maintenance and utility operations within right-of-way shall require that a plan be submitted to the Department of Public Works for traffic control around and through the work site. This work site safety and traffic control plan shall conform to the FDOT Design Standards 600-Series Indexes and be prepared by a person that holds a current Certificate of Qualification, and satisfactorily completed an FDOT approved Advanced Maintenance of Traffic Course. The Certificate Number and expiration date shall be provided on the first sheet of the Maintenance of Traffic Plans.

3-2 TRAFFIC SIGN REQUIREMENTS

3-2.1 FABRICATION OF STREET NAME SIGNS

All ground mounted street name sign assemblies shall be fabricated using the following material:

- (a) Street Sign assemblies will be fabricated with aluminum alloy 5052-H38 with a standard thickness of 0.080 inches, and nine inches (9") high in various lengths with $\frac{3}{4}$ " radius corners.
- (b) Sign blanks with a thickness of 0.063 inches will be accepted with prior approval of the City of Lakeland.
- (c) A Green and White sign, ASTM D4956 Type 1 (EG) is the minimum material that will meet FHWA requirements for the green background. For ground-mounted signs, ASTM D4956 Type II is the minimum material that will meet the proposed requirement for the white legend.
- (d) Lettering on street name signs shall be six inches (6"), highway font B text. Supplementary lettering to indicate the type of street (such as St, Av, Rd, etc.) or prefix (such as N, S, E, W) shall be in smaller lettering of four inches (4") in height. All signs shall have the City of Lakeland logo (swan). Block number shall be highway font C. A diagram showing dimensions, layout, spacing, etc. is shown in Section 300 of the City Standard Details.
- (e) City streets will be green background with white text as shown in Section 300 of the City Standard Details.
- (f) Private streets will be white background with green text (i.e. lettering is green) as shown in Section 300 of the City Standard Details.

- (g) One street name assembly will consist of two (2) separate sign blanks with text on one side, (one street name is two (2) blanks).
- (h) Street name assembly shall be reversed as shown in Section 300 of the City Standard Details.

Refer to Section 300 of the City Standard Details for sign details.

Suffixes shall be abbreviated as follows:

<u>FULL SUFFIX</u>	<u>ABBREVIATED</u>
Alley	Alley
Avenue	Ave
Boulevard	Blvd
Circle	Cir
Court	Ct
Cove	Cv
Crescent	Cs
Drive	Dr
Heights	Hgts
Highway	Hwy
Lane	Ln
Loop	Loop
Mobile Home Park	Mhp
Park	Park
Parkway	Pkwy
Path	Path
Place	Pl
Plaza	Pa
Point	Point
Road	Rd
Run	Run
Square	Sq
Street	St
Terrace	Ter
Trace	Tr
Trail	Trail
Way	Way
Walk	Walk

3-2.2 TRAFFIC SIGN INSTALLATION REQUIREMENTS

All equipment cut sheets shall be approved by the Manager of Traffic Operations. Signs shall be installed under the site supervision of personnel who have a minimum certification of International Municipal Signal Association (IMSA) Traffic Signs and Markings Level I.

Sign Specifications

- (a) All signs must meet the MUTCD and mounted in accordance with the MUTCD. Minimum mounting height for the bottom of the primary sign shall be 7'; as shown in Section 300 of the City Standard Details.
- (b) Round posts for mounting signs shall **NOT** be permitted.
- (c) Decorative posts shall **NOT** be permitted without prior consultation and authorization from Manager of Traffic Operations.
- (d) Single signs shall be mounted on U-channel 12-gauge hot dipped galvanized steel post 2 # per foot. Each post will have 7/16" holes drilled at 1" spacing for the entire length of the post. Posts shall be installed with a depth of 3' embedded in the ground.
- (e) All street name sign blanks will be punched with a 7/32" hole centered 1" from edge vertically and a 3/8" hole punched centered horizontally. (All sign blanks must be punched with holes that match whole number spacing by 1").

All street name signs shall consist of two (2) sign blanks and assembled together utilizing 8/32" x 3/8" machine screws and 8/32" Nylon nuts. These street name blanks shall be attached to the square posts using 2 1/2" hex-head bolts with Nylon nuts.

All street name signs and all warning signs with supplemental plaques shall be mounted on square 2" pre-punched 12-gauge galvanized steel post, 2 # per foot. Posts will be drilled with 7/16" holes spaced on 1" centers for the entire length of the post. If the street name sign is mounted in combination with a "STOP" or "YIELD" sign, then the "STOP" or "YIELD" sign will be considered the primary sign. All square posts shall have a "pyramid cap" attached to the top of post. Posts will be installed with a minimum of 3' embedded in the ground.

- (f) All square blanks must be horizontally and diagonally punched with a 3/8" hole (All sign blanks must be punched with holes that match whole number spacing by 1").
- (g) All uncontrolled crosswalks on local residential streets shall include:

- Double-sided “Pedestrian” Fluorescent Yellow-green warning signs;
- Double-sided “Downward Arrow” Fluorescent Yellow-green signs; and
- Single-sided “State Law Stop for Pedestrian” signs.

For Collector roads; curvilinear roadways; roads with limited visibility conditions; and/or directed by the Manager of Traffic Operations, "Pedestrian Crosswalk Ahead" Fluorescent Yellow-green warning signage only in the direction of traffic, on the right side of the road, shall be installed.

- (h) All sign blanks must have edges de-burred.
- (i) Signs shall **NOT** be attached to sign post with rivets.
- (j) Minimum size for “STOP” or “YIELD” signs shall be 30”, unless directed by the Manager of Traffic Operations.
- (k) For all 2” Square posts mounting hardware shall be 5/16” x 2 ½” hex-head bolts. For all 2 # per square inch Channel posts mounting hardware shall be 5/16 x 2” hex-head bolts. Nylon nuts shall be used for both bolt sizes.
- (l) Signs shall not be allowed to overlap other signs.
- (m) Sign posts are **not to be poured into concrete curb or sidewalk**. Four (4) inch diameter PVC or aluminum sleeve **MUST** be used for sign. Refer to Section 300 of the City Standard Details.
- (n) The backs of all signs installed within the Central Business District (CBD) must have black sheeting and mounted on black, powder coated 2” sign posts with black pyramid caps.
- (o) The legend “Dead End” shall not be used under any circumstances. Instead the “No Outlet” or “No Thru Traffic” sign may be used. The “No Outlet” or “No Thru Traffic” warning sign shall be horizontal (36” x 12”) with two (2) sign blanks.
- (p) All materials must be accepted as per the FDOT Approved Products List (APL), or be pre-approved by the Manager of Traffic Operations in writing.
- (q) When a regulation or safety condition is changed on a roadway, the “NEW” (W16-15P) sign in “Starburst” format shall be installed above the new regulation or safety sign condition.
- (r) For all Overhead Illuminated Street Name signs, please see Section 3-5 below.

(s) Any substitutions must be accepted in writing by the Director of Public Works or designee prior to ordering.

3-2.3 MAINTAINING MINIMUM RETRO REFLECTIVITY

Support:

Retro reflectivity is one of several factors associated with maintaining nighttime sign visibility as defined in the 2007 Edition of FHWA's "Maintaining Traffic Sign Retro Reflectivity" Section 2A.22.

Standard:

Public agencies or officials having jurisdiction shall use an assessment or management method that is designed to maintain sign retro reflectivity at or above the minimum levels (as noted in Table 2A-3 of the 2007 edition of FHWA's "Maintaining Traffic Sign Retro Reflectivity").

Support:

Compliance with the above Standard is achieved by having a method in place and using the method to maintain the minimum levels. Provided that an assessment or management method is being used, an agency or official having jurisdiction would be in compliance with the above standard even if there are some individual signs that do not meet the minimum retro reflectivity levels at a particular point in time.

Guidance:

Except for those signs specifically identified in the Option in this Section, one or more of the following assessment or management methods should be used to maintain sign retro reflectivity:

- (a) Visual Nighttime Inspection – The retro reflectivity of an existing sign is assessed by a trained sign inspector conducting a visual inspection from a moving vehicle during nighttime conditions. Signs that are visually identified by the inspector to have retro reflectivity below the minimum levels should be replaced.
- (b) Expected Sign Life – When signs are installed, the installation date is labeled or recorded so that the age of a sign is known. The age of the sign is compared to the expected sign life. The expected sign life is based on the experience of sign retro reflectivity degradation in a geographic area compared to the minimum levels. Signs older than the expected life should be replaced.
- (c) Blanket Replacement – All signs in an area/corridor, or of a given type,

should be replaced at specified intervals. This eliminates the need to assess retro reflectivity or track the life of individual signs. The replacement interval is based on the expected sign life, compared to the minimum levels, for the shortest-life material used on the affected signs.

- (d) Control Signs – Replacement of signs in the field is based on the performance of a sample of control signs. The control signs might be a small sample located in a maintenance yard or a sample of signs in the field. The control signs are monitored to determine the end of retro reflective life for the associated signs. All field signs represented by the control sample should be replaced before the retro reflectivity levels of the control sample reach the minimum levels.
- (e) Other Methods – Other methods developed based on engineering studies can be used.

Support:

Additional information about these methods is contained in the 2007 Edition of FHWA’s “Maintaining Traffic Sign Retro reflectivity” (see Section 1A.11).

Minimum Maintained Retro Reflectivity Levels

Minimum Maintained Retro Reflectivity Levels ¹					
Sign Color	Sheeting Type (ASTM D4956-04)				Additional Criteria
	Beaded Sheeting			Prismatic Sheeting III, IV, VI, VII, VIII, IX, X	
	I	II	III		
White on Green	W*; G ≥ 7	W*; G ≥ 15	W*; G ≥ 25	W ≥ 250; G ≥ 25	Overhead
	W*; G ≥ 7	W ≥ 120; G ≥ 15			Ground-mounted
Black on	Y*; O*	Y ≥ 50; O ≥ 50			2
Yellow or Black on Orange	Y*; O*	Y ≥ 75; O ≥ 75			3
White on Red	W ≥ 35; R ≥ 7				4
Black on White	W ≥ 50				—

1. The minimum maintained retro reflectivity levels shown in this table are in units of cd/lx/m² measured at an observation angle of 0.2° and an entrance angle of -4.0°.
 2. For text and fine symbol signs measuring at least 1200 mm (48 in) and for all sizes of bold symbol signs
 3. For text and fine symbol signs measuring less than 1200 mm (48 in)
 4. Minimum Sign Contrast Ratio ≥ 3:1 (white retro reflectivity ÷ red retro reflectivity)
- * This sheeting type should not be used for this color for this application.

Bold Symbol Signs		
<ul style="list-style-type: none"> • W1-1, -2 – Turn and Curve • W1-3, -4 – Reverse Turn and Curve • W1-5 – Winding Road • W1-6, -7 – Large Arrow • W1-8 – Chevron • W1-10 – Intersection in Curve • W1-11 – Hairpin Curve • W1-15 – 270 Degree Loop • W2-1 – Cross Road • W2-2, -3 – Side Road • W2-4, -5 – T and Y Intersection • W2-6 – Circular Intersection 	<ul style="list-style-type: none"> • W3-1 – Stop Ahead • W3-2 – Yield Ahead • W3-3 – Signal Ahead • W4-1 – Merge • W4-2 – Lane Ends • W4-3 – Added Lane • W4-5 – Entering Roadway Merge • W4-6 – Entering Roadway Added Lane • W6-1, -2 – Divided Highway Begins and Ends • W6-3 – Two-Way Traffic <ul style="list-style-type: none"> • W10-1, -2, -3, -4, -11, -12 – Highway-Railroad Warning 	<ul style="list-style-type: none"> • W11-2 – Pedestrian Crossing • W11-3 – Deer Crossing • W11-4 – Cattle Crossing • W11-5 – Farm Equipment Crossing • W11-6 – Snowmobile Crossing • W11-7 – Equestrian Crossing • W11-8 – Fire Station • W11-10 – Truck Crossing • W12-1 – Double Arrow <ul style="list-style-type: none"> • W16-5p, -6p, -7p – Pointing Arrow Plaques • W20-7a – Flagger • W21-1a – Worker
Fine Symbol Signs – Symbol signs not listed as Bold Symbol Signs.		
Special Cases		
<ul style="list-style-type: none"> • W3-1 – Stop Ahead: Red retro reflectivity ≥ 7 • W3-2 – Yield Ahead: Red retro reflectivity ≥ 7; White retro reflectivity ≥ 35 • W3-3 – Signal Ahead: Red retro reflectivity ≥ 7; Green retro reflectivity ≥ 7 • W3-5 – Speed Reduction: White retro reflectivity ≥ 50 • For non-diamond shaped signs such W14-3 (No Passing Zone), W4-4p (Cross Traffic Does Not Stop), or W13-1, -2, -3, -5 (Speed Advisory Plaques), use largest sign dimension to determine proper minimum retro reflectivity level. 		

3-3 TRAFFIC SIGNAL REQUIREMENTS

*NOTE: all equipment cut sheets **MUST** be approved in writing by the City of Lakeland Traffic Operations.

General Specifications

Control Cabinet Type 333 with Auxiliary Bay (see Section 3-3.1 below)

Standard Features

- 8-phase, 4-pedestrian operation (2 right turn overlaps available)
- 36 detector channel capability, (3 per turn, 6 per through movement)
- 2-channel or 4-channel industry standard detection modules
- Railroad preemption inputs (2)
- Emergency vehicle preemption inputs (4)
- DC isolation inputs for pedestrian push buttons and special functions
- Programmable “Yellow/Red” or “All Red” flashes using flash plugs
- 210 Signal Monitor slot
- Fluorescent cabinet light with door switch
- 8” riser

Assemblies

- 14-position input files (2)
- 12-position output files
- Combined power supply and Power Distribution Assembly (PDA)
- Flash transfer relay sockets (4)
- Dual-circuit flasher positions (2)
- Detector termination panel with terminal blocks
- Service panel
- Police panel with signal “On/Off” and “Auto/Flash” switches
- Controller shelf with pullout drawer
- Fixed shelves, full (2), half (1)

General Specifications

- Dimensions: 54” H x 44.5” W x 26” D (rounded to the nearest inch)
- 8”H riser brings total height to 62”
- Material: 5052-H32 aluminum, 0.125” thick
- Finishes: Natural, powder coat (standard, anti-graffiti, and custom colors), anodized
- Access: Front doors (2), back doors (2), all full size
- Latching System: 3-point, choice of Corbin or Best locks
- Handles: 3/4” round, stainless steel, with padlock feature
- Door Stops: 90° and 180° ($\pm 10^\circ$), each door, top
- Rack Assembly: Removable 19” EIA racks (2)
- Ventilation: Thermostatically controlled 100 CFM fans (2)
- Louvered air intake in doors, pleated filters
- Mounting: Base mounted

The following equipment **SHALL** be included:

- Econolite, NEMA-170 Controller
 - **Model: Safetran Cobalt-RackMount.**
 - **Active APL Certifications: 671-024-003 (Approval Date: 7/31/2015)**
 - **Product Type: NEMA-170 Controller Unit**
 - **Comments: Evaluated with firmware version 32.63.00 Configuration L3000, with Flashing Yellow Arrow Operation**
- Siemens - RuggedCom RS900 (Model # RS900-HI-P-L2L200)
Must be included is an Ethernet Cable (RJ45 to RJ45) from RS900 to Controller (6' in length)
- Owens Corning Fiber Optics Tray
1 (Model # C-MIC-024 105324 24-F Rack-MT Enclosure 19" 1U Empty add panels/trays)
4 (Model # FDC-CP1P-3C 214102 6 Port Panel SC SM Center Loaded)
Use with FDC Enclosure
- Fiber Optics Jumpers.
Two (2) Single Mode 2m SC to LC (3mm Diameter) jumpers
One (1) Single Mode 1m SC to SC (3mm Diameter) jumper.
- Emergency Pre-emption (Multimode System)
Shall be interoperable with existing infrared (IR) system
Shall use the newer Global Positioning System (GPS) system technology
- **Any substitutes must be accepted by the City of Lakeland Traffic Operations prior to ordering.**

UPS (external back-up)

- External UPS **MUST NOT BE MOUNTED ON TRAFFIC CONTROL CABINETS**
- Local Keypad Programmability – include status monitoring, setting/testing of various parameters, dry contact programming, and more. No laptop necessary.
- Backlit LCD Display - easily readable in all light conditions.

- Six Fully Programmable Dry Contacts – for control and reporting.
- Remote access via SNMP Ethernet.
- Provides fully interactive program and status reporting using built-in, Windows™- compatible software.
- Time/Date Stamp of Events and Alarms – up to 100 events with download and print capability.
- External cabinet LED indicator for ON BATTERY
- Specifications
 - Input / output Voltage (VAC) nominal 120/240**Frequency (Hz) nominal 60/50-60**
 - Input current 20 (A) maximum
 - Input voltage variation -23% to +17%
 - Voltage waveform sine
 - Typical line efficiency 95-97%
 - Output waveform THD <3% THD %
 - Max charge current 10 (ADC)
 - Max transfer time 60 (ms)
 - Audible noise <32 at 1m (dBA) - entire system, including transfer switch
 - Unit operating temp -37°C to +74°C
 - Battery operating temp -25°C to +74°C
 - Lightning / surge protection Passes ANSI/IEEE C.62.41/C.62.45 Cat A & B
 - ** PB-2000 ITS-E
- Output Ratings
 - PB-2000 ITS Output Power (VA) 2000
Active Output Power (watts) 1500
- Any substitutes must be accepted by the City of Lakeland Traffic Operations prior to ordering.

Video Detection

- Video detection processor (VDP) shall be available in a one, two, and four camera models, capable of set up using a USB mouse / pointing device and video monitor and must receive and output video from the front panel exclusively through BNC connections. VDP shall be rack mounted, compatible with TS-1, TS-2, 332, 333, or ITS cabinets. Processor shall have four detector output switches capable of off, temporary, and constant call states.

- When more than one VDP is present, a rack mounted device, capable of controlling and switching between up to four processors shall act as a common mouse point and video output point. That device shall act as a single point of set up and monitoring for all VDP modules. The video switching device shall connect up to 4 VDP modules via RJ45 connector and control up to 16 cameras. The video switching device shall communicate over standard Internet Protocol and address via IP standards; and stream video using MPEG4 and H.264 protocols. The scalable video stream shall allow up to 4 streams to be viewed simultaneously for monitoring or control of the intersection.
- Camera shall be color, auto-focus, variable zoom, with integrated sunshield. When circumstances require, an optional “Wide Dynamic Range” or wide-angle camera shall be available. All cameras must be compatible with VDP without special software requirements.
- Any substitutes must be accepted by the City of Lakeland Traffic Operations prior to ordering.
- If Loops are Required
 - Must use 6’ X 40’ type “F” for all long loops.
 - Must place type “F” loops at least 2’ in advance of stop bars.
 - Must place type “B” loops for thru movements a minimum of 50’ behind stop bars.

CCTV Video

All CCTV Cameras used within the City of Lakeland’s ATMS network **SHALL** be IP H.264 w/PoE and be HDTV 1080p and 32x optical zoom. Connections to the camera must be in a standard Ethernet format using a standard RJ 45 connector. Mounting brackets will include pole mount brackets.

- Any substitutes must be accepted by the City of Lakeland Traffic Operations prior to ordering and must be proven to work with the Genetec video system.

Pedestrian Push Button

All pedestrian detectors installed within the City of Lakeland shall meet the guidelines of American Disabilities Association (ADA) requirements for

Accessible Pedestrian Station (APS) and shall be installed as per the Manual on Uniform Traffic Control Devices (MUTCD) Section 4E.

- Independent automatic locator tone adjustment to ambient noise (if applicable)
- 2" ADA button with raised arrow (arrow should be adjustable for direction)
- Digital audio messages (if applicable)
- Vibro-tactile walk phase indication (if applicable)
- Two-wire operation
- Must meet or exceed ADA, MUTCD, TAC & PROWAAC Guidelines.
- Any substitutes must be accepted by the City of Lakeland Traffic Operations prior to ordering.
- Pedestrian Signals
- Pedestrian Signals shall be LED countdown type.
- Any substitutes must be accepted by the City of Lakeland Traffic Operations prior to ordering.

Illuminated Street Name Sign

- **ELECTRICAL**
 - All electrical wiring is stranded copper wire - #18 AWG 600 volts at 103°C
 - Signs are to be wired to a separate 15-amp circuit breaker at the electrical service.
 - Photo cells for the overhead illuminated signs will be installed at the electrical service.
 - All wire connections made with compression wire nuts
- **OVERHEAD SIGN DETAILS**
 - Sign frame 5052-H32 aluminum .090
 - LED (Light Emitting Diode)
 - Continuous stainless-steel hinge
 - Stainless steel latches
 - Sign panel .125 white polycarbonate
 - Powder coat - Customer selected
 - Legend - Green 3M EC film
 - Mounting - PELCO Astro bracket, on-mast arm or under mast arm, as required
 - Photocell
- Any substitutes must be accepted by the City of Lakeland Traffic Operations prior to ordering.

Mast Arms and Poles

- Reference FDOT standards
 - 17741
 - 17743
 - 17745
- All mast arms shall be galvanized steel unless specified differently within a bid contract.
- If mast arms are to be painted, then they must conform to the following:
 - Finish product must meet SSPC Paint Spec No. 36 QUFV-A Level 3 for weathering performance.
 - Color shall be according to Federal #27038 Semi-Gloss Black Chip.
- All hardware must be rigid mounted
- All hardware must be stainless steel (Cable Type)
- Any substitutes must be accepted by the City of Lakeland Traffic Operations prior to ordering.

3-3.1 TS2 Type 1 Rack Mounted Cabinet Assembly

Model NEMA Rack Mounted Type Cabinet

The cabinet shell shall meet the minimum requirements of a 333 type. The cabinet enclosure shall include, but not be limited to, enclosures, doors, hinges, gasketing, ventilation, latches, locks, police panel, cage supports, and mounting devices.

Base Adapter

When required by a special provision, a base adapter shall be furnished to match the exterior dimension and finish of the Type 333 cabinet furnished under this specification. The adapter shall have a minimum height of 6 inches.

Door Latches and Locks

The latching mechanism shall be a three-point drawer roller type. The locks and handles shall be on the left side of the front door and right side of the rear door. The lock and lock support shall be rigidly mounted on the door. A seal shall be provided to prevent dust or water entry thorough the lock opening. The cabinet locks shall be keyed to #2type locks.

Ventilation

The cabinet ventilation shall include an intake, exhaust, filtration, fan assembly, and environmental controls. Each electric fan shall be equipped with a ball or roller

bearing and have a capacity of minimum 100 Cubic Feet per Minimum (cfm). The fan shall be mounted with the housing and be vented. The fan shall be thermostatically controlled and shall be manually adjustable between 80-150 degrees Fahrenheit.

Cabinet Cage

A standard Electronic Industries Alliance (EIA) 19-inch rack cage shall be installed inside the housing for mounting of the controller unit and cabinet assemblies. The EIA rack portion of the cage shall consist of 2 pairs of continuous adjustable equipment mounting angels. The angles shall be tapped with 10-32 threads with EIA universal spacing. The angle shall comply with standard EIA-310-B and shall be supported at the top and bottom by either welded or bolted support angels to form a cage. There shall be a minimum of 2" of clearance above the controller at the top of the rack for fiber optic unit installation. As an option, there shall be space for a minimum of 6 auxiliary outlets, either all in one assembly or two assemblies of 3 outlets, located on each side in the rear of the cabinet, this allows for extra equipment power.

Aluminum Surface

The cabinet exterior shall be natural, unpainted aluminum, unless otherwise specified.

Lighting

When required by a special provision, fluorescent lamps shall be installed on the top of the front and rear part of the cabinet. Door control switches shall be installed on the front and rear doors. Opening of either door shall illuminate the lighting.

Each fluorescent lamp and switch shall be equipped with noise suppression devices. Activation of the fluorescent lamps and associated switches shall not cause any disruption of the controller or any other electrical or electronic device in the cabinet.

Fluorescent lamps and associated ballast transformers shall be rated for high output in cold environments (temperature of -25 degrees C/77 degrees F).

The cabinet lamp circuit shall be fused and the fuse holder shall be easily accessible from the front of the cabinet.

Pullout Drawer

A pullout drawer hinged at the top and sliding tracks shall be provided in the cabinet. The drawer shall have dimensions not exceeding 1"H X 16" D X 13" D.

The drawer assembly shall can hold 40 pounds when extended. The drawer shall be located so that access to the front panel of the controller is not restricted when a laptop computer is in use on the computer shelf.

A resalable print pouch shall be mounted to the door of the cabinet. The pouch shall be of sufficient size to accommodate one complete set of cabinet prints.

A minimum of two sets of complete and accurate cabinet drawings shall be supplied with each cabinet.

A minimum of one set of manuals for the controller, Malfunction Management Unit (MMU) and vehicle detector amplifiers shall be supplied with each cabinet.

Controller Assembly

The controller assembly shall be a Safetran Cobalt RackMount.

Terminals and Facilities

Output LoadBay Assembly

The output LoadBay assembly shall be a 19" rack mounted assembly used to house the loadswitches, flash transfer relays, connectors, terminal blocks, and other control devices so that complete connections can be established between the controller outputs and the field terminals. All 16-position output LoadBay assemblies are provided with a mounting mechanism which allows easy access to all wiring on the rear of the assembly without removal of any cabinet shelves or equipment.

The terminals and facilities shall be available as a minimum in the following configuration:

- Configuration #1 – Sixteen (16) load switch sockets, up to eight (8) flash transfer relay sockets, one (1) flasher socket, two (2) main panel Bus Interface Unit (BIU), one (1) sixteen channel detector rack with one (1) BIU, and one Type 16 MMU A dual-row, 64-pin female DIN 41612 Type B connector shall be provided for both edges of the BIU. Terminal and facilities BIU mounting shall be an integral part of the output LoadBay assembly.
- All BIU rack connectors shall have pre-wired address pins corresponding to the requirements of the TS2 specification. The address pins shall control the BIU mode of operation. BIUs shall be capable of being interchanged with no additional programming
- The 16-loadswitch position output LoadBay assembly shall have all field wires accessible in the rear of the assembly, on vertically mounted non-fused terminal blocks with a minimum rating of 10amps.
- All field input/output (I/O) terminals shall be identified by permanent alphanumerical labels. All labels shall use standard nomenclature per the NEMA TS2 specification.
- It shall be possible to flash either the yellow or red indications on any vehicle movement by means of Molex Flash Plugs.

- A minimum of one (1) flasher socket shall be in the power distribution assembly and shall can operate a 15amp, 2-pole, NEMA solid-state flasher. The flasher shall be well supported in the assembly.
- One RC network shall be wired in parallel with each group of three flash transfer relays and any other relay coils.
- All logic level NEMA controller and MMU input and output terminations on the output LoadBay assembly shall be permanently labeled.
- Terminations shall be provided as part of the output LoadBay assembly to provide access to the controller units programmable and non-programmable I/O when needed.

All terminal and facilities wiring shall conform to the following wire size and color:

GREEN/WALK LOAD SWITCH OUTPUT - 14 GAUGE BROWN WIRE
 YELLOW LOAD SWITCH OUTPUT - 14 GAUGE YELLOW WIRE
 RED/DON'T WALK LOAD SWITCH OUTPUT - 14 GAUGE RED WIRE
 MMU (OTHER THAN AC POWER) - 22 GAUGE VIOLET WIRE
 CONTROLLER I/O - 22 GAUGE BLUE WIRE
 AC LINE VARIOUS GAUGE BLACK WIRE
 AC NEUTRAL VARIOUS GAUGE WHITE WIRE
 EARTH GROUND VARIOUS GAUGE GREEN WIRE
 LOGIC GROUND VARIOUS GAUGE GRAY WIRE
 FLASH PROGRAMMING ORANGE WIRE

All wiring, 14AWG and smaller, shall conform to MIL-W-16878/1, Type B/N, 600V, 19-strand tinned copper. The wire shall have a minimum of 0.010 inches thick PVC insulation with clear nylon jacket and rated to 105 degrees Celsius. All 12 AWG and larger wire shall have UL listed THHN/THWN 90 degrees Celsius, 600V, 0.020 inches thick, PVC insulation and clear nylon jacketed.

Connecting cables between assemblies shall be sleeved in a braided nylon mesh or poly-jacketed.

Commonly reconfigurable wiring may be left out of the sleeving for ease of factory or field modifications, but shall be adequately protected against damage on the assembly edges.

All terminals and facilities configurations shall be provided with sufficient RS-485 Port 1 communication cables to allow for the intended operation of that cabinet. Each communication cable connector shall be a 15-pin metal shell D subminiature type. The cable shall be a shielded cable suitable for RS-485 communications. Each cable shall have a Port 12 connector on each end. This will allow that no hardwiring of cables is necessary and cables can be removed without the use of hand tools.

All output LoadBay assemblies shall be pre-wired for a Type-16 Malfunction Management Unit.

All wiring shall be neat in appearance. All cabinet wiring shall be continuous from its point of origin to its termination point. Butt type connections/splices are not acceptable.

Where needed, all connecting cables and wires shall be secured by mechanical clamps. Stick-on type clamps are not acceptable.

The grounding system in the cabinet shall be divided into three separate circuits (AC Neutral, Earth Ground, and Logic Ground). These ground circuits shall be connected at a single point.

The output LoadBay assembly shall incorporate a relay to remove +24 VDC from the common side of the load switches when the intersection is placed into mechanical flash. The relay shall have a momentary push button to apply power to the load switch inputs for ease of troubleshooting. As an alternate, the load switch power will be controlled through circuit breakers like the Caltrans signal bus circuit breakers. A minimum of 4 circuit breakers will be required for a standard 8 phase intersection.

All pedestrian push button inputs from the field to the controller shall be Opto-isolated through the BIU.

Pedestrian signals shall be wired on outputs 9 thru 12.

Power Distribution Assembly (PDA)

The power distribution assembly shall consist of a separate rack mountable module. The power distribution panel shall be wired to provide the necessary filtered power to the load switches, flasher, and cabinet power supply.

The power distribution assembly shall house the following components:

- One (1) NEMA cabinet power supply. As an alternate this unit will be rack mountable and have provisions for plugging into the PDA
- One (1) 16-channel TS2 MMU unit. As an alternate this unit will be rack mountable and have provisions for plugging into the PDA
- One (1) NEMA TYPE 5-15R GFI utility outlet
- A minimum of four (4) signal bus circuit breakers are wired for signal bus control of the load switches
- One (1) flasher socket with provisions to add an additional flasher socket if needed
- Two (2) 12-position feed thru terminal blocks shall be located on a fold down door on the rear of the PDA assembly and contain terminals for all power requirements within the NEMA TS2 cabinet environment

The hinged door on the rear of the assembly will allow for access to the MMU Interface Board (MIB). All power supply connections on the rear of the PDA assembly will be protected from accidental human contact when the hinged door is closed.

The rear of the power distribution assembly shall contain access to the MMU connections and power supply connection with plug-in devices that will interface with the terminals and facilities as required by the NEMA specification.

The rear of the power distribution assembly shall contain a minimum of five (5) power plug connectors for supplying power to existing and future cabinet assemblies for ease of connection and disconnection. The connectors shall be 12-pin Molex Robotic Type Connectors Model# 54332-1270 or exact equivalent.

Cabinet Switches

Police Door

The police door, at a minimum, shall contain the following switches, and access shall be provided without opening the main cabinet door.

Auto/Flash Switch

When in the flash position, power shall be maintained to the controller and the intersection shall be placed into flash. The controller shall be stop timed when in flash. When exiting flash, the start-up sequence will be initiated in the controller.

Signals On/Off Switch

In the OFF position, power shall be removed from the signal heads in the intersection and the controller shall continue to operate. When in the OFF position, the MMU shall not conflict or require reset.

Cabinet Auxiliary Switches

At a minimum, the following test switches shall be accessible when the cabinet door is open. These switches shall be an integral part of the power distribution assembly.

Auto/Flash Switch

When in flash, the power shall be maintained into the controller and the intersection shall be placed into flash. The controller shall not be stop timed when in flash.

Stop Time Switch

When applied, the controller shall be stop-timed in the current interval.

Control Equipment Power ON/OFF Switch

This switch shall control the power to the controller, MMU, and cabinet power supply AC.

Service Panel Assembly

A separate power auxiliary panel shall be located on the bottom portion of the service panel and be mounted on the cabinet rails (front to back). This assembly shall not interfere with access to the field terminals or the hinged door on the rear of the output LoadBay assembly; the power auxiliary unit will, at a minimum, contain the following components and be wired per the NEMA TS2 specification.

- An EDCO MODEL SHA-1210 Surge Suppressor minimum
- A 50 AMP, 125 VAC Radio Interference Line Filter

A normally open, 60amp Mercury Contactor, model Durakool BBC-732, or equivalent. As an alternate a suitable solid-state relay may be substituted for the mercury contactor as governed and specified by the approving agency which the cabinet will be supplied to. Recommended substitute for the mercury contractor shall be SSR Crydom Model# HA4875H or approved equal.

A minimum of one (1) 50-amp safety shut-off main circuit breaker will be installed in the cabinet. The safety shut-off breaker shall supply power to the controller, MMU, signals, cabinet power supply, and auxiliary assemblies. The safety shut-off breaker shall be in the rear of the cabinet assembly and be protected from accidental deactivation.

- A minimum of 1 (one) 15-position Neutral Bus Bar capable of connecting three #12 wires per position.
- A minimum of 1 (one) 15-position Ground Bus Bar capable of connecting three #12 wires per position.

Auxiliary Cabinet Equipment

Cabinet Power Supply

The cabinet power supply, at a minimum, shall meet the requirements of Section 5.3.5 of the current NEMA TS2 Standard. As an alternate, the cabinet power supply may be a plug-in device and plug into the power distribution assembly.

The cabinet power supply shall provide LED indicators for the line frequency, 12VDC, 12VAC, and 24VDC outputs.

The cabinet power supply shall provide (on the front panel) jack plugs for access to the +24 VDC for test purposes.

One cabinet power supply shall be included with each cabinet assembly.

As an alternate this unit will be configured for rack mounting and be a plug-in device in the power distribution assembly.

Malfunction Management Units (MMU)

Each cabinet assembly shall be supplied with one (1) MMU as defined by the requirements of Section 4 of the NEMA TS2 Standard.

MMUs shall be a Type 16. The MMU Model MMU-16LE shall have the capability to monitor Manual on Traffic Control Devices (MUTCD) and Flashing Yellow Arrow (FYA) left turn signal head configurations.

The MMU shall be packaged in such a way that the interfacing connectors for the cabinet do not cross over the front side of the rack assembly.
As an alternate, this unit may be configured for rack mounting and be a plug-in device in the power distribution assembly.

Bus Interface Units (BIU)

All BIUs shall meet the operating requirements of Section 8 of the NEMA TS2 Standard.

The BIU face plate may be half-width but shall have all indicators and connectors in place, as required by the NEMA specification.

The BIU shall be supplied with each cabinet to allow for maximum phase and function utilization for which the cabinet is designed.

Vehicle Detection

A minimum of two (2) vehicle detector amplifier racks shall be provided in each cabinet.

Detector Rack Assembly

Each detector rack assembly shall be rack mountable and include the capabilities to house a minimum of:

- 2 or 4 channel detector cards (total of 8/4)
- 16 detector inputs
- 1 BIU
- 4 channels of EVP preemption

Detection Interfacing

Each cabinet shall contain detector interface panels for connecting field loops and vehicle detector amplifiers. The panel shall be manufactured from FR4 G10 fiberglass, 0.062 inches thick, with a minimum of 2 oz. of copper for all traces.

One (1) 16-position interface panel shall be provided for each 16-channel detector rack in the cabinet. The interface panel shall be secured to a mounting plate and attached to the left side of the cabinet from the rear door.

Each interface panel shall allow for the connection of sixteen independent field loops. A ground bus terminal shall be provided between each loop pair terminal to provide a termination for the loop lead-in cable ground wire.

Each interface panel shall provide a 10-position terminal block to terminate the field wires for up to two (2) 2-channel preemption devices.

Lightning protection mounting holes shall be provided to accommodate an EDCO SRA-16C lightning protection device. Lightning protection devices shall be provided when called for in the special provisions or specification.

A cable consisting of 20 AWG twisted pair wires shall be provided to enable connection to and from the interface panel to the detector rack assembly. The twisted pair wires shall be color coded red and white and be encased in nylon mesh sleeving for protection.

All termination points shall be identified by a unique number and be silkscreened on the panel.

Each detector rack shall accommodate rack mountable preemption devices. Each detector rack shall be powered by the cabinet power supply and be connected to the power supply by means of a detector rack power cable with a 12-pin Molex Robotic Type Connector Model# 54332-1270 or exact equal. Each BIU shall include power-on, transmit and, valid data indicators. All indicators shall be LEDs.

SECTION 4. OTHER LAND DEVELOPMENT REQUIREMENTS

4-1 SOLID WASTE SERVICE FACILITIES

Facilities shall be provided to facilitate solid waste pickup according to the Land Development Code and according to the specifications contained in Index 800. Exceptions may be granted by the Public Works Department on a case by case basis when the applicant can provide clear evidence that all solid waste generated, can be disposed of with not more than two 95-gallon containers emptied once per week or where a rollout dumpster is feasible. Customers should be advised that alternative collection methods may result in higher collection fees as determined by the approved Solid Waste Division Rate Resolution. The request for a Solid Waste Variance must be approved by the Solid Waste Manager for curbside pick-up service. A Request for Solid Waste Variance form has been placed at the end of this manual.

4-2 MISCELLANEOUS

Please refer to Section 2-5 “Design High Water” and Section 2-6 “Culvert Design” for subdivision development finished floor elevations. Multiple criteria are required to be met for subdivision developments and the Standards try to provide minimum criteria to assist with development plans.

SECTION 5. STANDARD DETAIL DRAWINGS

The Standard Drawings contained in this Section shall be used according to this Manual for proposed public and private developments within the City Limits. The details shown in the FDOT Design Standards shall also be included as part of this section.